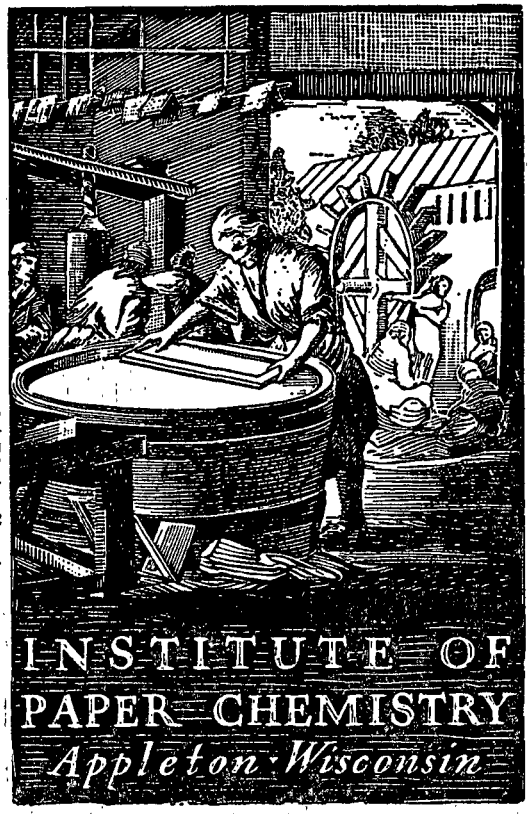

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

Project 1108-17

Progress Report 31

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

July 1, 1958

SCRAMBLED CODE LETTERS FOR THE CONTINUOUS EVALUATION OF CORRUGATING MEDIUM, PROGRESS REPORT 31, DATED July 1, 1958

JUNE DATA

Mill Code	Company	Machine No.
A	The Chesapeake Corporation, West Point	1
B	International Paper Company, Georgetown	1
C	Owens-Illinois Glass Company - Big Island	1
D	Hindo and Dauch of Canada - Trenton	1
E	The Mead Corporation, Harriman	1
F	Olin Mathieson Chemical Corporation, Monroe	2
G	The Mead Corporation, Sylva	1
H	Owens-Illinois Glass Company, Tomahawk	1
I	Olin Mathieson Chemical Corporation, Monroe	1
J	Union Bag-Camp Paper Corporation, Savannah	2
K	The Mead Corporation, Lynchburg	2
L	Owens-Illinois Glass Company, Tomahawk	2
M	St. Joe Paper Company, Port St. Joe	1
N	West Virginia Pulp and Paper Company, Covington	7
O	International Paper Company, Georgetown	2
P	International Paper Company, Bastrop	2
Q	Owens-Illinois Glass Company, Tomahawk	3
R	Continental Can Company, Hopewell	1
S	North Carolina Pulp Company, Plymough	3*
T	Muskingum Fibre Products Company, Coshocton	1
U	International Paper Company, Bastrop	1
V	Owens-Illinois Glass Company, Big Island	2
W	West Virginia Pulp and Paper Company, Covington	6
X	Gaylord Container Corporation, Bogalusa	4

* This machine was formerly identified as No. 1.

SCRAMBLED CODE LETTERS FOR THE CONTINUOUS EVALUATION OF CORRUGATING MEDIUM, PROGRESS REPORT 31, DATED July 1, 1958

MAY DATA

Mill Code	Company	Machine No.
A	Olin Mathieson Chemical Corporation, Monroe	2
B	The Mead Corporation, Harriman	1
C	Hindo and Dauch of Canada, Trenton	1
D	The Mead Corporation, Sylva	1
E	Owens-Illinois Glass Company, Tomahawk	1
F	Olin Mathieson Chemical Corporation, Monroe	1
G	St. Joe Paper Company, Port St. Joe	1
H	West Virginia Pulp and Paper Company, Covington	7
I	International Paper Company, Georgetown	2
J	North Carolina Pulp Company, Plymouth	3*
K	Muskingum Fibre Products Company, Coshocton	1
L	International Paper Company, Bastrop	1
M	The Chesapeake Corporation, West Point	1
N	International Paper Company, Georgetown	1
O	Owens-Illinois Glass Company, Big Island	1
P	Union Bag-Camp Paper Corporation, Savannah	2
Q	The Mead Corporation, Lynchburg	2
R	Owens-Illinois Glass Company, Tomahawk	2
S	International Paper Company, Bastrop	2
T	Owens-Illinois Glass Company, Tomahawk	3
U	Continental Can Company, Inc., Hopewell	1
V	West Virginia Pulp and Paper Company, Covington	6
W	Gaylord Container Corporation, Bogalusa	4
X	Owens-Illinois Glass Company, Big Island	2

* This machine was formerly identified as No. 1.

SCRAMBLED CODE LETTERS FOR THE CONTINUOUS EVALUATION OF CORRUGATING MEDIUM, PROGRESS REPORT 31, DATED July 1, 1958

APRIL DATA

Mill Code	Company	Machine No.
A	The Mead Corporation, Sylva	1
B	North Carolina Pulp Company, Plymouth	3°
C	Muskingum Fibre Products Co., Coshocton	1
D	Olin Mathieson Chemical Corporation, Monroe	1
E	The Mead Corporation, Harriman	1
F	International Paper Company, Bastrop	2
G	Owens-Illinois Glass Company, Big Island	1
H	Continental Can Company, Inc., Hopewell	1
I	West Virginia Pulp and Paper Company, Covington	6
J	Gaylord Container Corporation, Bogalusa	4
K	International Paper Company, Georgetown	2
L	The Mead Corporation, Lynchburg	2
M	St. Joe Paper Company	1
N	Olin Mathieson Chemical Corporation, Monroe	2
O	Owens-Illinois Glass Company, Big Island	2
P	International Paper Company, Georgetown	1
Q	Owens-Illinois Glass Company, Tomahawk	3
R	The Chesapeake Corporation, West Point	1
S	Owens-Illinois Glass Company, Tomahawk	2
T	Union Bag-Camp Paper Corporation, Savannah	2
U	International Paper Company, Bastrop	1
V	Owens-Illinois Glass Company, Tomahawk	1
W	West Virginia Pulp and Paper Company, Covington	7
X	Hindo and Dauch of Canada, Trenton, Ontario	1

° This machine (No. 3) is the same as was formerly identified as No. 1.

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

Project 1108-17

Progress Report 31

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

July 1, 1958

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THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

PREFACE

This report presents the test results on rolls of corrugating medium which, if conditions were normal, would have been evaluated at The Institute of Paper Chemistry during the months of April, May, and June. However, conditions have not been normal because of the change-over to a new corrugator and consequently evaluation of the rolls received during this change-over period has been delayed. Evaluation of these rolls has now been completed and the present report is concerned with the results for this change-over period--i.e., the months of April, May, and June. Hence, it is in actuality three reports in one and is divided into three principal parts. Part I presents complete results for the month of April. It may be recalled that incomplete results were presented in Progress Report 30 dated May 1, 1958--i.e., no single-face flat crush on runability data were available. Part II presents complete results for the month of May and Part III presents complete results for the month of June. It should be mentioned here that scrambled code letters have been used for the three months so that a given machine will have a different code letter for each month. The code letters for your company are shown on the inside of the front cover of this report. A comparison of runability and single-face flat crush test data for rolls evaluated on both the old and the new corrugators is presented in the appendix of this report. It may be noted from these comparisons that the single-face flat crush test results appear to be lower for the new corrugator, whereas runability data appear to be

about the same for both corrugators. The individual machine data and the composite data--i.e., the current machine averages and the current F.K.I. averages--also indicate that the single-face flat crush is lower for the new corrugator. At the present time the cause of this lower single-face flat crush is being investigated and is believed to be related to a difference in forming pressure between the rolls of the two corrugators. This pressure problem is further complicated by a difference in the diameters of the corrugating rolls--8 inches for the old corrugator and 12 inches for the new. An effort is being made to resolve this problem which is the subject of further discussion in the appendix of this report.

PART I

RESULTS FOR APRIL 1-30 (REVISED)

At the time the results for the month of April were tabulated and sent to the members of the Fourdrinier Kraft Board Institute, the change-over to the new corrugator was in progress and, as a consequence of this, no single-face flat crush or runability results were available for inclusion in Progress Report 30 dated May 1, 1958. These results have now been obtained on the new corrugator and the tabulation of complete data for each machine for the month of April is presented in this part of the report.

As a matter of review, it may be recalled that during the month of April, ninety-one rolls of corrugating medium were selected from the production of nineteen machines and submitted to The Institute of Paper Chemistry for evaluation. A tabulation of the number of roles submitted from each machine is given in Table I.

TABLE I

DISTRIBUTION OF CORRUGATING MEDIUM SAMPLES

Machine Code	Number of Samples
A	2
B	3
C	7
D	0
E	4
F	0
G	6
H	10
I	1
J	6
K	0
L	2
M	15
N	3
O	6

TABLE I--Continued

DISTRIBUTION OF CORRUGATING MEDIUM SAMPLES

Machine Code	Number of Samples
P	5
Q	3
R	0
S	4
T	7
U	4
V	2
W	0
X	1
Total	91

Each roll of corrugating medium was evaluated for basis weight, caliper, Concora flat crush, H. and D. flat crush (single-faced board), and runability. Runability was measured by corrugating each roll under standardized conditions on the Institute's corrugator into A-flute board at 600 feet per minute with minimum tension. If unsatisfactory runability occurred at this speed, the corrugator was slowed down in increments of 25 f.p.m. until satisfactory runability was obtained (no ruptured flutes). If the medium fabricated satisfactorily at 600 f.p.m. with minimum tension, further runs were made at higher tensions to determine when cracking occurred. The higher tensions used were 0.5 lb. per inch, 1.0 lb. per inch, and 1.5 lb. per inch.

Flat crush was determined on the board obtained at the highest speed with minimum tension. In addition to information about quality, these results will provide data which may be useful in studying the relationship between Concora flat crush and combined board flat crush for each participant's medium.

As requested by members of the F.K.B.I., the Concora medium test results are calculated on the basis of pounds of load per unit area rather than on the basis of the formula suggested by the Concora manufacturer and are reported as Concora flat crush test results. In Progress Reports One and Two, the Concora medium test results were reported on the basis of the formula suggested by the Concora manufacturer.

The average test results obtained on the samples of corrugating medium submitted by each participant are shown in Table II and graphically presented in Figures 1 to 4. In addition to a comparison of the test data obtained for the various machines, Table II also presents the current F.K.I. averages, cumulative F.K.I. averages, and the F.K.I. indexes. The current F.K.I. average is the average of test results for all machines participating in the study during a given month. The cumulative F.K.I. average is based on the results for the previous twelve-month period excluding the result for the current period. The F.K.I. index is obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

The F.K.I. index provides a ready means of comparing the current quality with previous results. An index greater than 100% indicates that current quality is higher than the average result for the previous twelve periods; an index below 100% indicates that current quality is lower than the average result for the previous twelve periods.

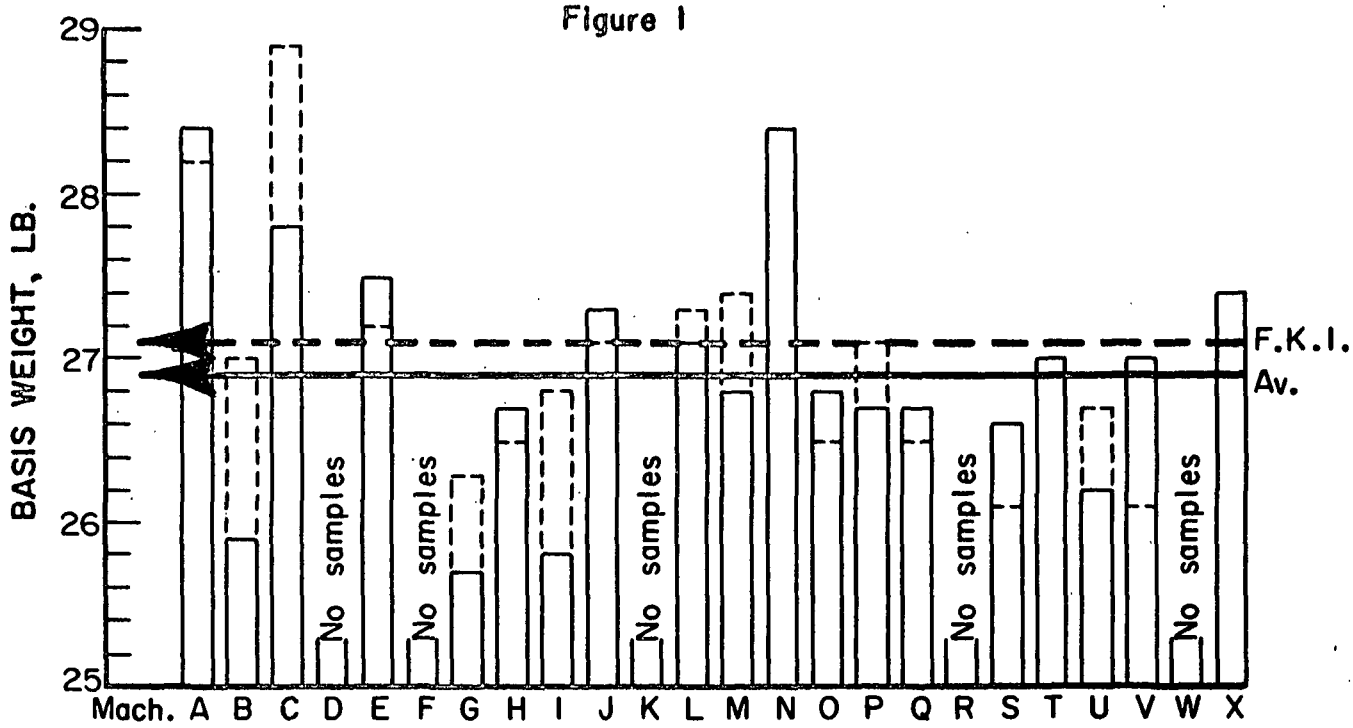
The test results obtained on the sample lots submitted from the production of each of the machines are shown in Tables III through XXVI for for Machines A through X, respectively. The maximum, minimum, and average test results obtained on each sample lot (roll) are shown for all tests except

TABLE II

SUMMARY OF CURRENT MACHINE AVERAGES
April, 1958

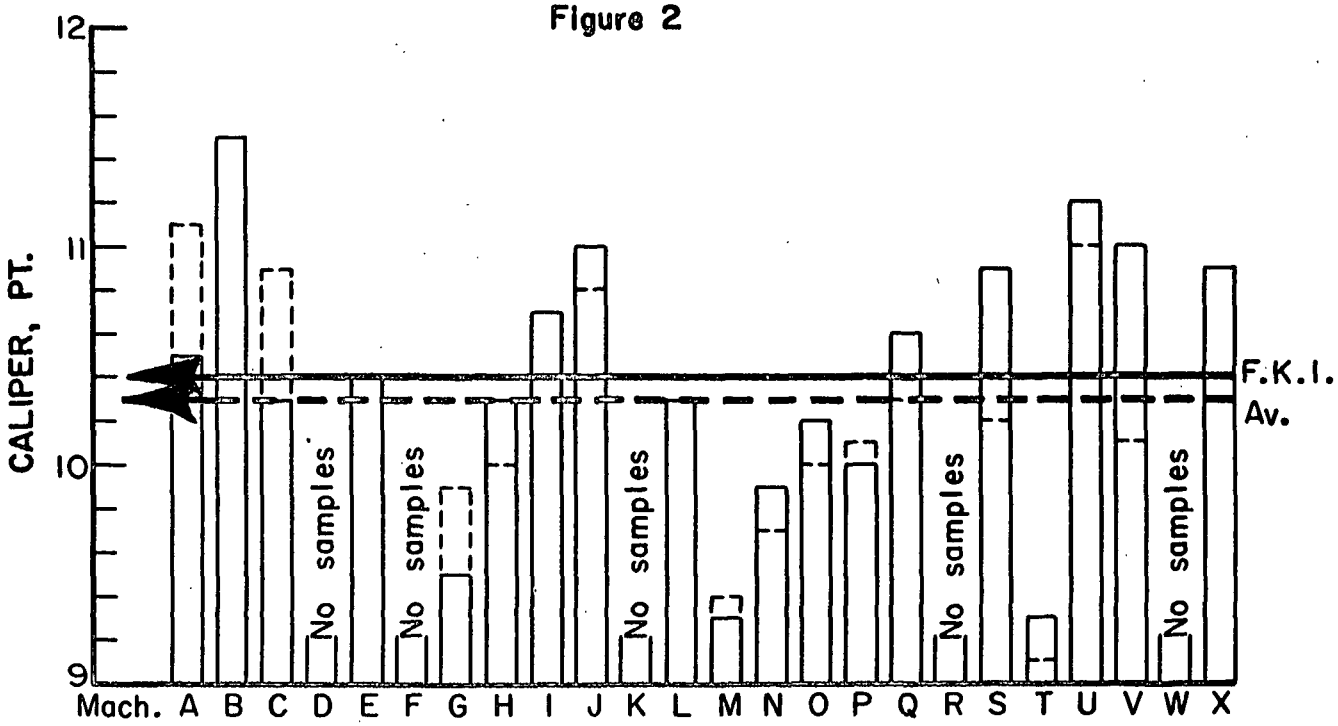
Machine Code	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	28.4	10.5	34.7	34.5
B	25.9	11.5	36.4	34.3
C	27.8	10.3	33.3	31.6
D		No samples submitted.		
E	27.5	10.4	33.4	30.2
F		No samples submitted.		
G	25.7	9.5	35.3	33.2
H	26.7	10.3	34.4	32.8
I	25.8	10.7	36.0	35.6
J	27.3	11.0	32.5	29.8
K		No samples submitted.		
L	27.1	10.3	35.0	33.4
M	26.8	9.3	32.8	32.0
N	28.4	9.9	36.8	35.9
O	26.8	10.2	35.4	33.0
P	26.7	10.0	36.9	35.9
Q	26.7	10.6	35.3	34.0
R		No samples submitted.		
S	26.6	10.9	35.0	34.2
T	27.0	9.3	35.5	33.8
U	26.2	11.2	37.9	36.3
V	27.0	11.0	35.6	34.4
W		No samples submitted		
X	27.4	10.9	26.6	28.8
Current F.K.I. Average	26.9	10.4	34.7	33.4
Cumulative F.K.I. Average	27.1	10.3	35.2	36.4
F.K.I. Index, %	99.3	101.3	98.6	91.7

Figure 1



COMPARISON OF BASIS WEIGHT RESULTS
April, 1958

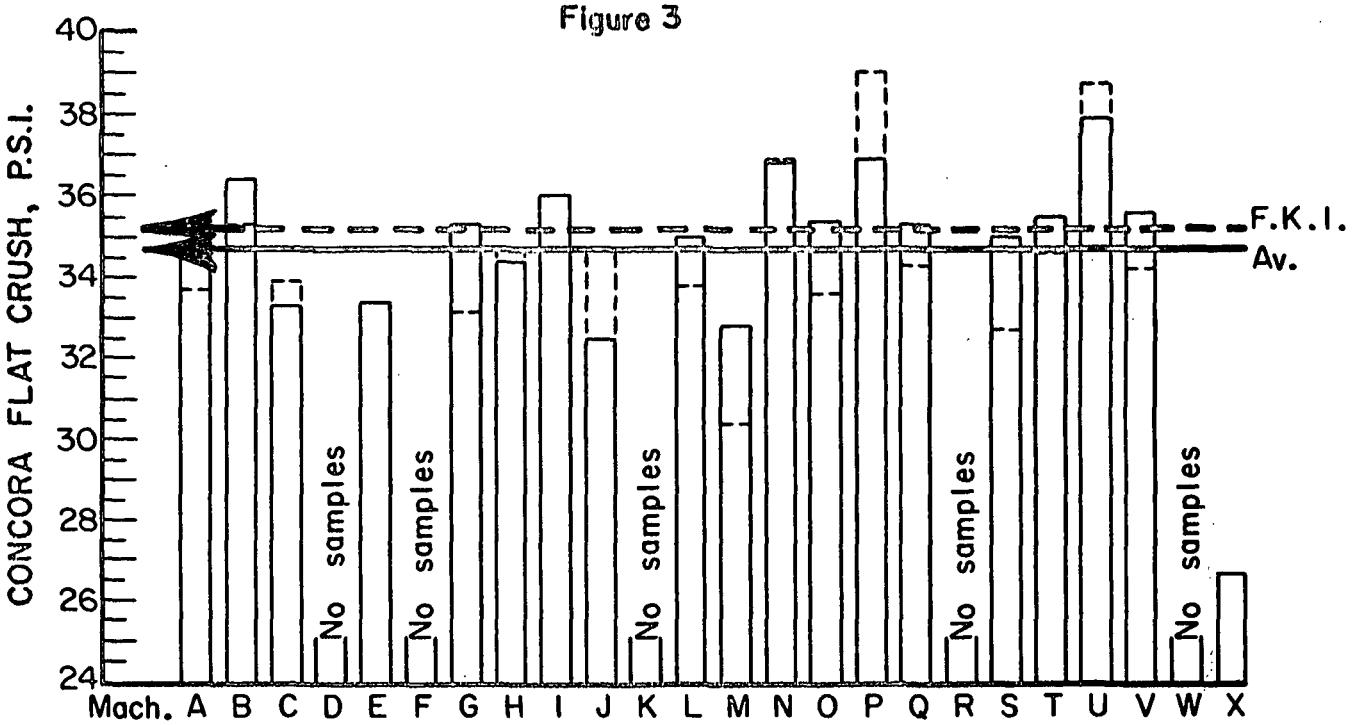
Figure 2



COMPARISON OF CALIPER RESULTS
April, 1958

——— Current machine average
- - - - - Cumulative machine average

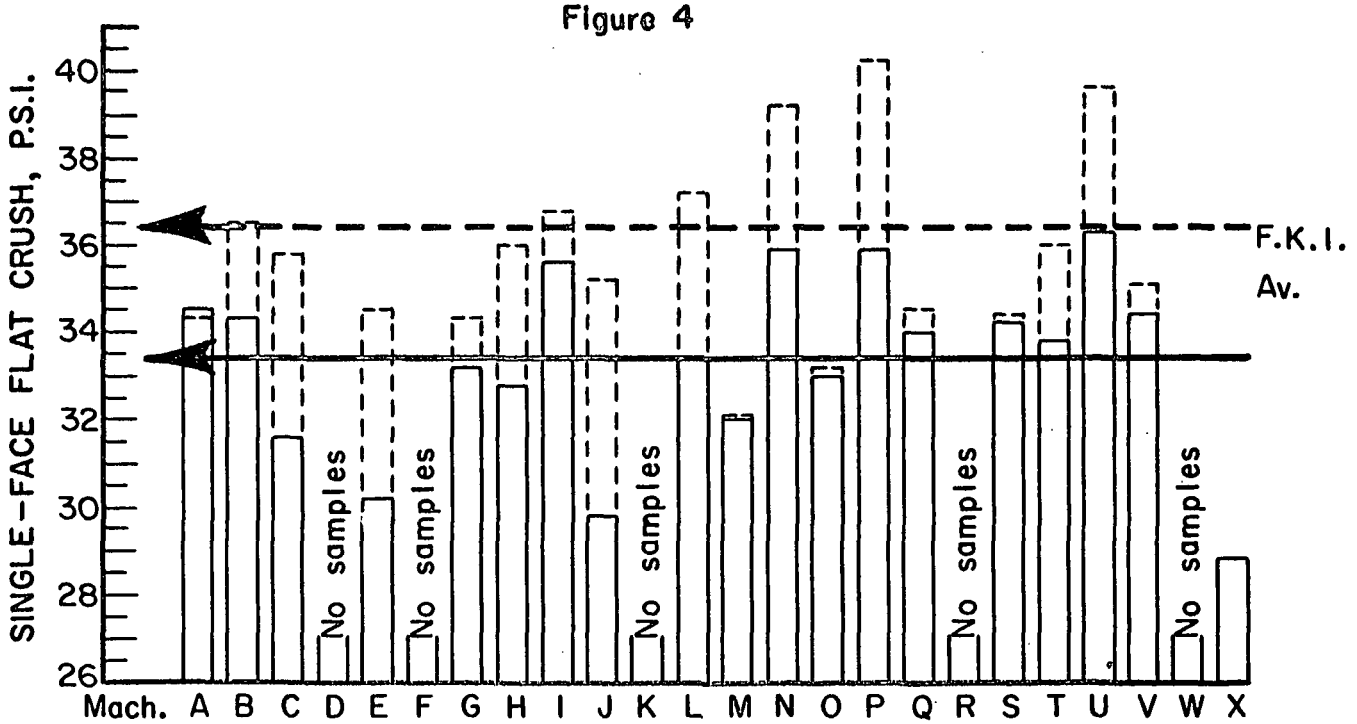
Figure 3



COMPARISON OF CONCORA FLAT CRUSH RESULTS

April, 1958

Figure 4



COMPARISON OF SINGLE-FACE FLAT CRUSH RESULTS

April, 1958

——— Current machine average

– – – – – Cumulative machine average

basis weight for which only the average is shown; in addition, the over-all average result for all sample lots submitted from a given machine is shown for each test. The latter over-all averages are reported as "current machine averages." A cumulative machine average is also shown and is calculated by averaging the current machine averages for the previous twelve periods (excluding the current period). Also shown for each machine in Tables III to XXVI are the machine factor and machine index which are defined as follows:

$$\frac{\text{current machine average}}{\text{cumulative machine average}} \times 100 = \text{machine factor (\%)}$$

$$\frac{\text{current machine average}}{\text{cumulative F.K.I. average}} \times 100 = \text{machine index (\%)}$$

The machine factor and machine index provide a means for comparing the current machine average with either the previous results for that particular machine or with the cumulative results for all machines--i.e., the cumulative F.K.I. average.

As was mentioned before, the basis weight, caliper, and Concora flat crush test results were discussed in Progress Report 30. It was noted in that report that basis weight varied from a low of 25.7 lb. for Machine G to a high of 28.4 lb. for Machine A and N. The current F.K.I. average was 26.9 lb., slightly lower than the cumulative F.K.I. average of 27.1 lb. The average results for Machines B, G, and I were below the minimum weight requirements of Rule 41.

Caliper results during April varied from a low value of 9.3 points for Machine M and T to a high value of 11.5 points for Machine B. The current F.K.I. caliper average was 10.4 points, slightly higher than the cumulative

F.K.I. average of 10.3 points. The average results for all machines were in agreement with Rule 41.

Concora flat crush test results ranged from a minimum of 26.6 p.s.i. for Machine X to a maximum of 37.9 p.s.i. for Machine U. The current F.K.I. average was 34.7 p.s.i., slightly lower than the cumulative F.K.I. average of 35.2 p.s.i.

In Table II and Figure 4 it may be seem that single-face flat crush averages for the various machines ranged from a minimum value of 28.8 p.s.i. for Machine X to a maximum of 36.3 p.s.i. for Machine U. The current F.K.I. average of 33.4 p.s.i. was lower than the cumulative F.K.I. average of 36.4 p.s.i. A discussiom of this difference was given in the preface to this report.

For the month of April, the current F.K.I. average associated with the caliper test results was higher than the corresponding cumulative F.K.I. average and the current F.K.I. averages associated with basis weight, Concora flat crush, and single-face flat crush were lower than their corresponding cumulative F.K.I. averages.

The comparison of Institute and mill Concora flat crush test results which was initiated in Progress Report 30 is shown in Table XXVII. This table is unchanged from Progress Report 30 except that data for Machine J have been added. These data were not available when this report was assembled.

TABLE III

SUMMARY OF TEST RESULTS FOR MACHINE A
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
A-1	4-8-58	4-14-58	33	28.1	10.8	10.2	10.5	37.2	31.8	34.2	35.4	32.2	33.4	Satisfactory at 600 f.p.m.[a]
A-2	4-8-58	4-14-58	34	28.7	10.8	10.2	10.6	36.6	33.6	35.2	38.4	32.8	35.5	Satisfactory at 600 f.p.m.[a]
Current Machine Average:				28.4			10.5			34.7			34.5	
Cumulative Machine Average:				28.2			11.1			33.7			34.3	
Machine Factor, %				100.7			94.8			102.9			100.6	
Machine Index, %				104.7			102.3			98.6			94.8	

TABLE IV

SUMMARY OF TEST RESULTS FOR MACHINE B
April, 1958

B-1	3-21-58	3-31-58	—	26.0	12.1	11.3	11.8	41.4	33.6	37.0	36.4	29.8	33.6	Satisfactory at 600 f.p.m.[b]
B-2	3-27-58	4-10-58	791	24.6	11.3	10.7	11.0	36.6	32.4	34.7	35.2	31.0	32.6	Satisfactory at 600 f.p.m.[a]
B-3	4-9-58	4-17-58	283	27.2	12.0	11.2	11.7	40.2	35.4	37.4	38.6	34.6	36.7	Satisfactory at 600 f.p.m.[c]
Current Machine Average:				25.9			11.5			36.4			34.3	
Cumulative Machine Average:				27.0			11.5			35.3			36.5	
Machine Factor, %				96.1			100.0			103.0			94.0	
Machine Index, %				95.7			111.6			103.4			94.3	

[a] With minimum tension.
[b] With tension of 1 lb./in.
[c] With tension of 1/2 lb./in.

TABLE V

SUMMARY OF TEST RESULTS FOR MACHINE C
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
C-1	3-25-58	4- 3-58	149	27.1	10.6	9.2	10.1	37.2	31.2	34.3	34.8	32.8	34.1	Satisfactory at 600 f.p.m.[a]
C-2	4- 1-58	4- 7-58	150	28.2	10.7	10.1	10.4	37.2	31.8	34.3	30.4	29.4	29.9	Satisfactory at 600 f.p.m.[a]
C-3	4- 3-58	4- 7-58	151	27.6	10.8	10.0	10.4	37.2	33.0	34.6	34.0	32.2	32.7	Satisfactory at 600 f.p.m.[b]
C-4	4- 8-58	4-14-58	152	28.4	10.9	10.3	10.7	34.8	31.2	32.8	31.6	30.2	30.8	Satisfactory at 600 f.p.m.[c]
C-5	4-10-58	4-16-58	153	28.5	10.6	9.8	10.1	33.6	30.6	31.8	33.2	30.8	31.6	Satisfactory at 600 f.p.m.[d]
C-6	4-15-58	4-19-58	154	26.9	10.6	9.8	10.1	34.2	28.8	31.9	30.6	28.0	29.3	Satisfactory at 600 f.p.m.[b]
C-7	4-17-58	4-21-58	155	27.8	11.0	10.0	10.5	35.4	30.0	33.1	33.6	31.8	32.8	Satisfactory at 600 f.p.m.[a]
Current Machine Average				27.8			10.3			33.3			31.6	
Cumulative Machine Average				28.9			10.9			33.9			35.8	
Machine Factor, %				96.3			94.6			98.2			88.3	
Machine Index, %				102.5			100.4			94.6			86.9	

TABLE VI

SUMMARY OF TEST RESULTS FOR MACHINE D
April, 1958

No samples submitted.

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1/2 lb./in.
[c] With minimum tension.
[d] With tension of 1 lb./in.

TABLE VII

SUMMARY OF TEST RESULTS FOR MACHINE E
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
E-1	3-25--58	4- 2-58	29	28.9	11.1	10.3	10.8	37.2	33.0	35.3	34.2	28.6	31.6	Satisfactory at 600 f.p.m.[a]
E-2	3-25-58	4- 2-58	30	25.7	10.7	10.0	10.2	34.2	30.6	32.0	29.6	26.2	27.9	Satisfactory at 600 f.p.m.[b]
E-3	4-16-58	4-22-58	35	27.4	10.8	10.2	10.5	34.8	31.2	33.1	31.0	28.4	29.8	Satisfactory at 600 f.p.m.[a,b]
E-4	4-17-58	4-22-58	36	28.0	10.2	9.9	10.0	34.2	31.2	33.1	32.6	30.0	31.4	Satisfactory at 600 f.p.m.[b]
Current Machine Average:				27.5			10.4			33.4			30.2	
Cumulative Machine Average				27.2			10.4			33.4			34.5	
Machine Factor, %				100.9			100.0			100.0			87.5	
Machine Index, %				101.4			100.8			94.9			83.1	

TABLE VIII

SUMMARY OF TEST RESULTS FOR MACHINE F
April, 1958

No samples submitted.

[a] With minimum tension.
[b] With tension of 1/2 lb./in.

TABLE IX

SUMMARY OF TEST RESULTS FOR MACHINE G
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
G-1	3-8-58	3-31-58	--	25.6	9.5	9.0	9.2	39.0	36.6	37.6	38.2	34.8	36.2	Satisfactory at 600 f.p.m.[a]
G-2	3-12-58	3-31-58	--	26.3	9.8	9.3	9.5	38.4	33.6	35.5	37.8	33.8	35.9	Satisfactory at 600 f.p.m.[b]
G-3	3-15-58	4-15-58	--	26.2	9.8	9.2	9.6	37.8	32.4	34.8	33.8	31.6	32.6	Satisfactory at 600 f.p.m.[a]
G-4	3-18-58	4-15-58	--	25.6	9.9	9.3	9.6	36.6	33.6	35.5	34.0	30.0	32.2	Satisfactory at 600 f.p.m.[a]
G-5	4- 2-58	4-23-58	--	24.9	9.8	9.3	9.7	34.8	30.0	33.4	32.6	26.4	30.2	Satisfactory at 600 f.p.m.[a]
G-6	4- 4-58	4-23-58	--	25.8	9.8	9.2	9.5	37.8	31.8	34.9	32.8	31.0	32.0	Satisfactory at 600 f.p.m.[c]
Current Machine Average				25.7			9.5			35.3			33.2	
Cumulative Machine Average				26.3			9.9			33.1			34.3	
Machine Factor, %				98.0			96.5			106.6			96.7	
Machine Index, %				94.9			92.8			100.3			91.2	

[a] With tension of 1 lb./in.
[b] With tension of 1/2 lb./in.
[c] With tension of 1-1/2 lb./in.

TABLE X

SUMMARY OF TEST RESULTS FOR MACHINE H
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
H-1	3-19-58	3-31-58	71	26.3	10.7	10.2	10.4	36.0	32.4	34.3	32.6	30.0	31.2	Satisfactory at 600 f.p.m.[a]
H-2	3-19-58	3-31-58	72	26.8	10.7	10.2	10.4	31.2	29.4	30.5	32.2	30.4	31.6	Satisfactory at 600 f.p.m.[a]
H-3	3-25-58	4- 2-58	73	26.8	11.0	10.0	10.6	37.8	34.2	36.5	34.4	32.0	32.9	Satisfactory at 600 f.p.m.[a]
H-4	3-27-58	4- 2-58	74	27.1	10.3	10.0	10.1	45.0	38.4	40.3	38.0	35.0	36.8	Satisfactory at 600 f.p.m.[a]
H-5	4- 2-58	4-15-58	75	26.3	10.7	10.2	10.4	37.8	32.4	34.3	36.6	33.8	34.5	Satisfactory at 600 f.p.m.[b]
H-6	4- 4-58	4-14-58	76	27.1	10.6	10.2	10.4	34.2	31.8	32.9	34.2	31.2	32.7	Satisfactory at 600 f.p.m.[a]
H-7	4-10-58	4-19-58	77	26.4	10.5	10.0	10.2	36.0	33.6	35.0	34.0	32.4	33.1	Satisfactory at 600 f.p.m.[c]
H-8	4-10-58	4-19-58	78	27.8	10.6	9.7	10.2	36.0	33.0	34.7	37.4	32.4	34.2	Satisfactory at 600 f.p.m.[d]
H-9	4-15-58	4-22-58	79	26.6	10.7	10.0	10.4	34.2	31.8	33.1	32.6	28.2	30.9	Satisfactory at 600 f.p.m.[b]
H-10	4-16-58	4-22-58	80	25.8	10.2	9.9	10.0	34.8	29.4	31.9	31.4	29.0	30.3	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.7			10.3			34.4			32.8	
Cumulative Machine Average				26.5			10.0			34.7			36.0	
Machine Factor, %				100.8			103.0			99.1			91.3	
Machine Index, %				98.5			100.2			97.7			90.3	

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1 lb./in.
[c] With tension of 1/2 lb./in.
[d] With minimum tension.

TABLE XI

SUMMARY OF TEST RESULTS FOR MACHINE I
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
I-1	4-8-58	4-14-58	163	25.8	11.0	10.4	10.7	38.4	33.6	36.0	37.4	34.4	35.6	Satisfactory at 600 f.p.m.[b]
Current Machine Average				25.8			10.7			36.0			35.6	
Cumulative Machine Average				26.8			10.4			36.0			36.8	
Machine Factor, %				96.1			103.2			100.0			96.8	
Machine Index, %				95.0			104.3			102.4			97.9	

TABLE XII

SUMMARY OF TEST RESULTS FOR MACHINE J
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
J-1	3-19-58	3-31-58	14	28.8	12.0	11.2	11.6	29.4	25.8	28.4	30.6	28.4	29.8	Satisfactory at 600 f.p.m.[a]
J-2	3-21-58	3-31-58	15	28.8	12.3	11.4	11.8	35.4	27.0	31.3	29.6	27.8	28.7	Satisfactory at 600 f.p.m.[a]
J-3	3-25-58	4- 8-58	16	27.1	11.0	10.2	10.5	36.6	30.0	33.4	32.4	28.4	30.4	Satisfactory at 600 f.p.m.[a]
J-4	3-30-58	4-14-58	17	26.0	11.6	10.5	10.8	33.0	30.0	31.6	30.8	26.6	28.3	Satisfactory at 600 f.p.m.[b]
J-5	4- 2-58	4-14-58	18	26.7	11.0	10.5	10.8	40.2	33.6	36.0	34.6	30.6	32.8	Satisfactory at 600 f.p.m.[b]
J-6	4- 4-58	4-21-58	19	26.3	10.6	10.0	10.3	36.0	32.4	34.6	31.4	26.2	28.7	Satisfactory at 600 f.p.m.[c]
Current Machine Average				27.3			11.0			32.5			29.8	
Cumulative Machine Average				27.1			10.8			34.7			35.2	
Machine Factor, %				100.7			101.5			93.6			84.7	
Machine Index, %				100.6			106.8			92.5			82.0	

[a] With tension of 1/2 lb./in.
[b] With tension of 1 lb./in.
[c] With minimum tension.

TABLE XIII

SUMMARY OF TEST RESULTS FOR MACHINE K
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
No samples submitted.														

TABLE XIV

SUMMARY OF TEST RESULTS FOR MACHINE L
April, 1958

L-1	--	4-14-58	31	27.2	10.8	10.1	10.6	36.0	33.0	34.8	35.2	32.4	33.7	Satisfactory at 600 f.p.m.[a]
L-2	--	4-14-58	32	27.0	10.3	9.8	10.0	37.8	33.6	35.2	34.2	32.4	33.1	Satisfactory at 600 f.p.m.[b]
Current Machine Average				27.1			10.3			35.0			33.4	
Cumulative Machine Average				27.3			10.3			33.8			37.2	
Machine Factor, %				99.3			100.0			103.4			89.8	
Machine Index, %				100.1			100.0			99.5			91.9	

[a] With tension of 1 lb./in.
[b] With tension of 1/2 lb./in.

TABLE XV

SUMMARY OF TEST RESULTS FOR MACHINE M
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
M-1	3-19-58	3-31-58	19	26.3	9.5	8.9	9.1	42.0	36.0	39.4	38.6	34.0	36.7	Satisfactory at 600 f.p.m.[a]
M-2	3-19-58	3-31-58	20	26.4	9.5	8.9	9.2	36.6	33.6	35.4	36.8	32.8	35.0	Satisfactory at 600 f.p.m.[b]
M-3	3-19-58	3-31-58	21	26.8	9.8	8.9	9.3	39.0	36.6	37.3	36.8	33.4	34.8	Satisfactory at 600 f.p.m.[b]
M-4	3-25-58	4- 1-58	22	26.6	9.8	9.0	9.6	31.2	29.4	30.2	32.8	30.8	31.8	Satisfactory at 600 f.p.m.[a]
M-5	3-25-58	4- 1-58	23	28.9	9.9	9.0	9.5	34.2	31.8	33.0	32.8	28.8	30.4	Satisfactory at 600 f.p.m.[a]
M-6	3-25-58	4- 1-58	24	26.7	9.8	9.0	9.3	32.4	29.4	31.3	32.4	31.2	31.7	Satisfactory at 600 f.p.m.[a]
M-7	3-31-58	4- 8-58	25	27.1	9.9	9.0	9.3	37.8	31.8	34.2	34.8	32.0	33.6	Satisfactory at 600 f.p.m.[c]
M-8	3-31-58	4- 8-58	26	27.6	9.8	9.2	9.6	36.6	34.2	35.3	33.8	31.0	32.5	Satisfactory at 600 f.p.m.[c]
M-9	3-31-58	4- 8-58	27	27.7	10.0	8.9	9.6	34.2	33.0	33.6	33.8	32.8	33.4	Satisfactory at 600 f.p.m.[c]
M-10	4- 1-58	4-14-58	28	26.3	9.7	9.0	9.3	33.6	30.6	32.3	34.4	32.4	33.4	Satisfactory at 600 f.p.m.[a]
M-11	4- 1-58	4-14-58	29	26.3	9.8	8.9	9.1	34.8	30.6	32.3	33.2	31.6	32.5	Satisfactory at 600 f.p.m.[c]
M-12	4- 1-58	4-14-58	30	26.5	9.8	8.9	9.3	34.8	34.2	34.7	35.0	32.6	33.9	Satisfactory at 600 f.p.m.[b]
M-13	4-11-58	4-24-58	31	26.4	9.6	8.8	9.1	29.4	28.2	28.4	29.2	25.6	26.8	Satisfactory at 600 f.p.m.[a]
M-14	4-11-58	4-24-58	32	26.7	10.0	8.8	9.0	30.6	22.8	26.5	29.0	24.2	26.6	Satisfactory at 600 f.p.m.[a]
M-15	4-11-58	4-24-58	33	26.1	9.3	8.5	8.9	29.4	27.0	28.4	28.6	26.2	27.4	Satisfactory at 600 f.p.m.[b]
Current Machine Average				26.8			9.3			32.8			32.0	
Cumulative Machine Average				27.4			9.4			30.4			32.1	
Machine Factor, %				98.0			98.5			107.9			99.9	
Machine Index, %				99.0			90.3			93.4			88.1	

[a] With tension of 1/2 lb./in.
[b] With tension of 1 lb./in.
[c] With tension of 1-1/2 lb./in.

TABLE XVI

SUMMARY OF TEST RESULTS FOR MACHINE N
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
N-1	3-26-58	3-31-58	130	28.1	10.2	9.3	9.8	39.6	34.2	37.0	38.0	35.2	36.2	Satisfactory at 200 f.p.m.[a]
N-2	3-26-58	3-31-58	131	28.7	10.2	9.3	9.8	42.6	37.2	40.3	37.8	36.6	37.2	Satisfactory at 150 f.p.m.[a]
N-3	4- 4-58	4-14-58	132	28.3	10.4	9.8	10.1	34.8	30.6	33.0	36.6	31.4	34.3	Satisfactory at 200 f.p.m.[a]
Current Machine Average				28.4			9.9			36.8			35.9	
Cumulative Machine Average				28.4			9.7			36.9			39.2	
Machine Factor, %				100.0			102.2			99.7			91.4	
Machine Index, %				104.6			96.1			104.6			98.7	

TABLE XVII

SUMMARY OF TEST RESULTS FOR MACHINE O
April, 1958

O-1	3- 9-58	3-31-58	--	26.3	9.8	9.0	9.5	37.8	32.4	34.8	34.4	29.4	31.8	Satisfactory at 600 f.p.m.[b]
O-2	3-11-58	3-31-58	--	27.4	10.2	9.8	10.0	39.6	37.2	38.4	37.2	35.4	36.6	Satisfactory at 600 f.p.m.[c]
O-3	3-13-58	4-15-58	--	26.6	10.7	10.0	10.4	37.2	33.6	35.2	33.8	31.0	32.2	Satisfactory at 600 f.p.m.[c]
O-4	3-14-58	4-15-58	--	26.2	10.5	9.9	10.2	33.0	32.4	32.9	35.8	32.8	34.0	Satisfactory at 600 f.p.m.[c]
O-5	3-21-58	4-23-58	--	26.7	10.8	10.1	10.4	36.0	33.6	34.1	33.8	31.0	32.2	Satisfactory at 600 f.p.m.[d]
O-6	4- 3-58	4-23-58	--	27.6	11.2	10.5	10.9	37.8	34.2	35.8	33.2	30.4	31.4	Satisfactory at 600 f.p.m.[c]
Current Machine Average				26.8			10.2			35.2			33.0	
Cumulative Machine Average				26.5			10.0			33.6			33.2	
Machine Factor, %				101.0			102.0			104.6			99.4	
Machine Index, %				98.8			99.4			100.8			90.8	

[a] With minimum tension.
[b] With tension of 1/2 lb./in.
[c] With tension of 1 lb./in.
[d] With tension of 1-1/2 lb./in.

TABLE XVIII

SUMMARY OF TEST RESULTS FOR MACHINE P
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
P-1	3-26-58	3-31-58	211	27.1	10.2	9.8	10.0	42.0	36.6	38.5	39.4	37.4	38.1	Satisfactory at 600 f.p.m.[a]
P-2	3-27-58	4- 1-58	212	26.9	10.1	9.7	9.9	39.6	34.2	36.2	37.6	34.0	35.1	Satisfactory at 600 f.p.m.[a]
P-3	3-31-58	4- 7-58	213	26.3	10.6	10.0	10.2	40.2	37.8	38.9	37.0	35.0	35.8	Satisfactory at 600 f.p.m.[a]
P-4	4- 4-58	4-10-58	214	26.3	10.5	9.9	10.1	37.8	37.2	37.3	37.0	35.2	36.0	Satisfactory at 600 f.p.m.[b]
P-5	4-15-58	4-21-58	215	26.8	10.8	9.8	10.0	36.0	31.8	33.7	36.2	33.6	34.5	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.7			10.0			36.9			35.9	
Cumulative Machine Factor, %				27.1			10.1			39.0			40.2	
Machine Factor, %				98.4			99.3			94.6			89.4	
Machine Index, %				98.4			97.5			105.1			98.8	

TABLE XIX

SUMMARY OF TEST RESULTS FOR MACHINE Q
April, 1958

Q-1	3-28-58	4- 3-58	--	27.0	11.3	10.3	10.7	38.4	34.2	37.0	40.0	35.4	37.2	Satisfactory at 600 f.p.m.[d]
Q-2	4- 1-58	4-21-58	--	26.3	10.8	10.0	10.5	34.2	31.8	33.1	33.6	31.4	32.2	Satisfactory at 600 f.p.m.[c]
Q-3	4- 3-58	4-21-58	--	26.7	10.8	10.2	10.5	38.4	34.2	35.8	35.2	29.2	32.6	Satisfactory at 600 f.p.m.[c]
Current Machine Average				26.7			10.6			35.3			34.0	
Cumulative Machine Average				26.5			10.3			34.3			34.5	
Machine Factor, %				100.7			102.4			102.9			98.7	
Machine Index, %				98.4			102.7			100.3			93.6	

[a] With tension of 1 lb./in.
[b] With tension of 1-1/2 lb./in.
[c] With minimum tension.
[d] With tension of 1/2 lb./in.

TABLE XX

SUMMARY OF TEST RESULTS FOR MACHINE R
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
No samples submitted.														

TABLE XXI

SUMMARY OF TEST RESULTS FOR MACHINE S
April, 1958

S-1	3-10-58	4- 3-58	--	26.3	10.8	10.0	10.3	35.4	30.6	33.5	35.4	32.6	33.8	Satisfactory at 600 f.p.m.[a]
S-2	3-27-58	4- 3-58	--	27.0	12.5	11.2	11.8	42.0	37.8	39.1	38.8	33.8	36.4	Satisfactory at 600 f.p.m.[b]
S-3	4- 3-58	4-21-58	--	26.7	11.0	10.7	10.8	37.2	33.0	34.6	34.8	31.6	33.0	Satisfactory at 600 f.p.m.[c]
S-4	4-11-58	4-21-58	--	26.5	11.0	10.6	10.8	34.8	31.2	32.9	34.0	33.0	33.6	Satisfactory at 600 f.p.m.[b]
Current Machine Average				26.6			10.9			35.0			34.2	
Cumulative Machine Average				26.1			10.2			32.7			34.4	
Machine Factor, %				102.0			106.7			107.0			99.4	
Machine Index, %				98.2			106.3			99.6			94.0	

[a] With tension of 1 lb./in.
[b] With tension of 1/2 lb./in.
[c] With minimum tension.

TABLE XXII

SUMMARY OF TEST RESULTS FOR MACHINE T
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
T-1	3-25-58	3-31-58	168	27.1	9.9	9.3	9.8	37.8	31.8	34.8	34.2	30.4	31.8	Satisfactory at 600 f.p.m.[a]
T-2	4- 6-58	4-10-58	169	27.2	9.8	9.0	9.4	37.8	34.2	35.2	38.4	34.8	36.2	Satisfactory at 600 f.p.m.[b]
T-3	--	4-14-58	170	26.5	9.6	9.0	9.3	40.2	36.6	38.4	37.0	32.2	34.8	Satisfactory at 600 f.p.m.[b]
T-4	--	4-17-58	171	26.5	10.0	8.9	9.4	34.8	33.0	34.3	34.8	33.4	34.0	Satisfactory at 600 f.p.m.[b]
T-5	4-11-58	4-17-58	172	26.7	9.2	8.9	9.0	38.4	33.0	35.3	36.8	33.8	35.2	Satisfactory at 600 f.p.m.[a]
T-6	--	4-17-58	173	27.4	9.9	9.0	9.3	36.6	34.2	34.7	33.0	28.2	30.3	Satisfactory at 600 f.p.m.[a]
T-7	4-13-58	4-17-58	174	27.5	9.4	8.8	9.1	37.2	33.0	35.5	35.4	33.6	34.5	Satisfactory at 600 f.p.m.[b]
Current Machine Average				27.0			9.3			35.5			33.8	
Cumulative Machine Average				26.9			9.1			34.6			36.0	
Machine Factor, %				100.4			102.3			102.4			93.9	
Machine Index, %				99.6			90.6			100.8			93.1	

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1 lb./in.

TABLE XXIII

SUMMARY OF TEST RESULTS FOR MACHINE U
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
U-1	4- 8-58	4-14-58	361	25.8	12.2	10.8	11.5	37.2	34.2	36.4	37.8	33.4	35.2	Satisfactory at 600 f.p.m.[a]
U-2	4-11-58	4-14-58	362	26.2	11.8	10.9	11.3	40.8	37.8	38.9	39.2	36.4	37.9	Satisfactory at 600 f.p.m.[b]
U-3	4-15-58	4-19-58	363	26.8	11.3	10.5	10.9	42.6	38.4	40.3	39.0	35,6	37.2	Satisfactory at 600 f.p.m.[b]
U-4	4-18-58	4-21-58	364	25.9	11.5	10.6	10.9	36.6	35.4	36.0	35.4	34.6	34.8	Satisfactory at 600 f.p.m.[c]
Current Machine Average				26.2			11.2			37.9			36.3	
Cumulative Machine Average				26.7			11.0			38.7			39.6	
Machine Factor, %				98.1			101.4			98.0			91.8	
Machine Index, %				96.5			108.4			107.8			99.8	

TABLE XXIV

SUMMARY OF TEST RESULTS FOR MACHINE V
April, 1958

V-1	3-26-58	4- 3-58	--	26.2	11.1	10.9	11.0	38.4	33.0	34.9	36.2	32.6	33.9	Satisfactory at 600 f.p.m.[c]
V-2	4-10-58	4-21-58	--	27.8	11.4	10.9	11.0	37.8	34.8	36.4	36.6	33.6	35.0	Satisfactory at 600 f.p.m.[c]
Current Machine Average				27.0			11.0			35.6				
Cumulative Machine Average				26.1			10.1			34.2				
Machine Factor, %				103.3			108.8			104.1				
Machine Index, %				99.6			107.4			101.4				

[a] With tension of 1 lb./in.
[b] With tension of 1-1/2 lb./in.
[c] With tension of 1/2 lb./in.

TABLE XXV

SUMMARY OF TEST RESULTS FOR MACHINE W
April, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
No samples submitted.														

TABLE XXVI

SUMMARY OF TEST RESULTS FOR MACHINE X
April, 1958

X-1	4-17-58	4-24-58	1	27.4	11.2	10.4	10.9	28.2	25.8	26.6	29.4	28.4	28.8	Satisfactory at 600 f.p.m.[a]
Current Machine Average				27.4			10.9			26.6			28.8	
Cumulative Machine Average				--			--			--			--	
Machine Factor, %				--			--			--			--	
Machine Index, %				100.9			105.9			75.8			79.2	

[a] With tension of 1-1/2 lb./in.

TABLE XXVII

COMPARISON OF INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS FOR APRIL, 1958

Machine A

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
A-1	33	4-8-58	34.2	37.0	+2.8
A-2	34	4-8-58	35.2	35.7	+0.5

Machine G

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
G-1	--	3- 8-58	37.6	--	--
G-2	--	3-12-58	35.5	--	--
G-3	--	3-15-58	34.8	--	--
G-4	--	3-18-58	35.5	--	--
G-5	--	4- 2-58	33.4	40.6	+7.2
G-6	--	4- 4-58	34.9	39.9	+5.0

Machine H

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
H-1	71	3-19-58	34.3	--	--
H-2	72	3-19-58	30.5	--	--
H-3	73	3-25-58	36.5	--	--
H-4	74	3-27-58	40.3	--	--
H-5	75	4- 2-58	34.3	38.5	+4.2
H-6	76	4-4-58	32.9	38.8	+5.9
H-7	77	4-10-58	35.0	37.9	+2.9
H-8	78	4-10-58	34.7	39.5	+4.8
H-9	79	4-15-58	33.1	37.9	+4.8
H-10	80	4-16-58	31.9	36.2	+4.3

Machine J

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
J-1	14	3-19-58	28.4	26.9	-1.5
J-2	15	3-21-58	31.3	29.9	-1.4
J-3	16	3-25-58	33.4	--	--
J-4	17	3-30-58	31.6	25.1	-6.5
J-5	18	4- 2-58	36.0	30.5	-5.5
J-6	19	4- 4-58	34.6	32.9	-1.7

Machine M

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
M-1	19	3-19-58	39.4	--	--
M-2	20	3-19-58	35.4	--	--
M-3	21	3-19-58	37.3	--	--
M-4	22	3-25-58	30.2	--	--
M-5	23	3-25-58	33.0	--	--
M-6	24	3-25-58	31.3	--	--
M-7	25	3-31-58	34.2	--	--
M-8	26	3-31-58	35.3	--	--
M-9	27	3-31-58	33.6	--	--
M-10	28	4- 1-58	32.3	41.5	+9.2
M-11	29	4- 1-58	32.3	40.2	+7.9
M-12	30	4- 1-58	34.7	41.5	+6.8
M-13	31	4-11-58	28.4	35.0	+6.6
M-14	32	4-11-58	26.5	34.4	+7.9
M-15	33	4-11-58	28.4	35.2	+6.8

Machine O

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
O-1	--	3- 9-58	34.8	--	--
O-2	--	3-11-58	38.4	--	--
O-3	--	3-13-58	35.2	--	--
O-4	--	3-14-58	32.9	--	--
O-5	--	3-21-58	35.6	40.9	+5.3
O-6	--	4- 3-58	35.8	41.7	+5.9

Machine L

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
L-1	31	--	34.8	36.8	+2.0
L-2	32	--	35.2	35.6	+0.4

Machine P

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
P-1	211	3-26-58	38.5	--	--
P-2	212	3-27-58	36.2	--	--
P-3	213	3-31-58	38.9	--	--
P-4	214	4- 4-58	37.3	38.9	+1.6
P-5	215	4-15-58	33.7	36.6	+2.9

Machine U

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
U-1	361	4-8-58	36.4	43.2	+6.8
U-2	362	4-11-58	38.9	40.8	+1.9
U-3	363	4-15-58	40.3	41.4	+1.1
U-4	364	4-18-58	36.0	40.6	+4.6

Note: The differences shown in this table indicate the position of the Mill results in relation to the Institute results which were used as the reference line.

PART II

RESULTS FOR MAY 1-31

During the month of May, seventy-four rolls of corrugating medium were selected from the production of twenty machines and submitted to The Institute of Paper Chemistry for evaluation. A tabulation of the number of rolls submitted from each machine is given in Table I.

TABLE I

DISTRIBUTION OF CORRUGATING MEDIUM SAMPLES

Machine Code	Number of Samples
A	3
B	2
C	6
D	2
E	2
F	0
G	6
H	0
I	0
J	2
K	8
L	7
M	1
N	6
O	2
P	3
Q	4
R	3
S	0
T	2
U	7
V	5
W	1
X	2
Total	74

Each sample of corrugating medium was evaluated for basis weight, caliper, Concora flat crush, H. and D. flat crush (single-faced board), and runability. Runability was measured by corrugating each roll under standardized conditions on the Institute's corrugator into A-flute board at 600 feet per minute with minimum tension. If unsatisfactory runability occurred at this speed, the corrugator was slowed down in increments of 25 f.p.m. until satisfactory runability was obtained (no ruptured flutes). If the medium fabricated satisfactorily at 600 f.p.m. with minimum tension, further runs were made at higher tensions to determine when cracking occurred. The higher tensions used were 0.5 lb. per inch, 1.0 lb. per inch, and 1.5 lb. per inch.

Flat crush was determined on the board obtained at the highest speed with minimum tension. In addition to information about quality, these results will provide data which may be useful in studying the relationship between Concora flat crush and combined board flat crush for each participant's medium.

As requested by members of the F.K.B.I., the Concora medium test results are calculated on the basis of pounds of load per unit area rather than on the basis of the formula suggested by the Concora manufacturer and are reported as Concora flat crush test results. In Progress Reports One and Two, the Concora medium test results were reported on the basis of the formula suggested by the Concora manufacturer.

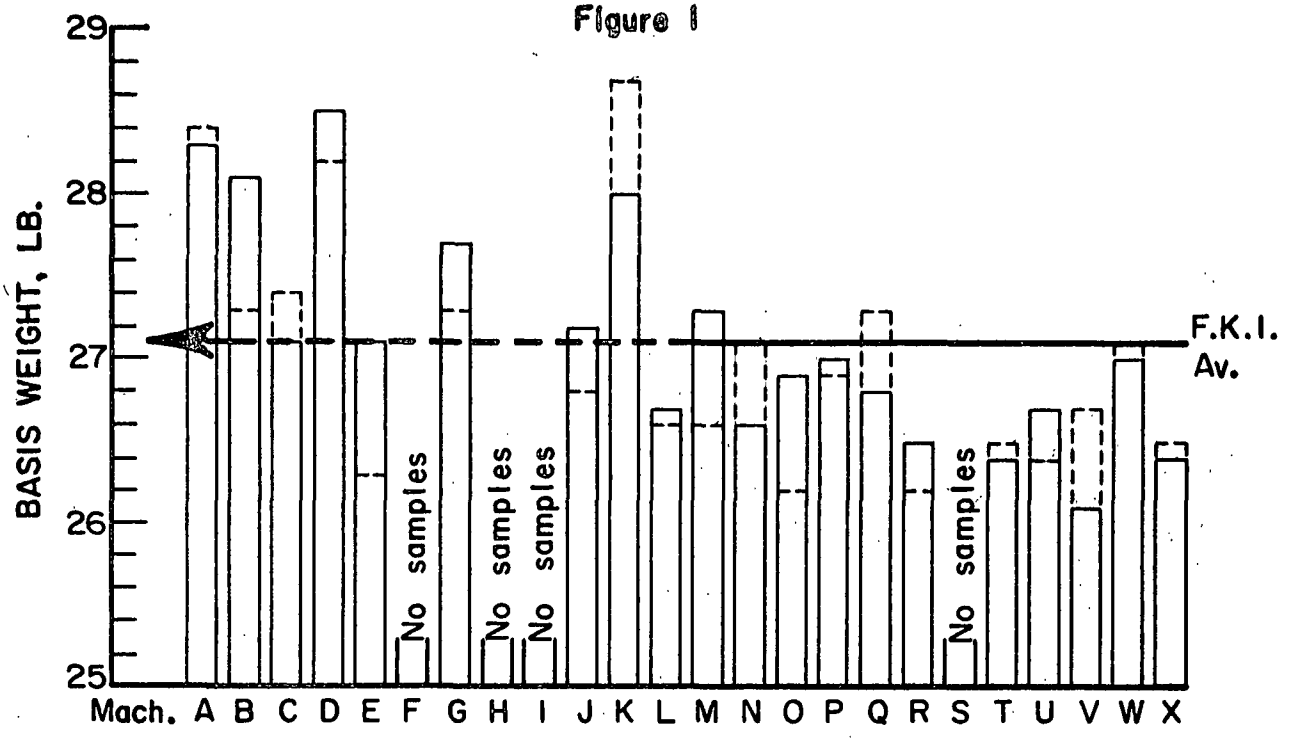
The average test results obtained on the samples of corrugating medium submitted by each participant are shown in Table II and graphically presented in Figures 1 to 4. In addition to a comparison of the test data

TABLE II

SUMMARY OF CURRENT MACHINE AVERAGES
May, 1958

Machine Code	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	28.3	10.1	32.6	30.8
B	28.1	10.6	33.5	34.0
C	27.1	10.8	29.3	27.8
D	28.5	11.1	37.0	33.6
E	27.1	10.5	36.7	33.5
F	No samples submitted.			
G	27.7	9.3	32.9	31.0
H	No samples submitted.			
I	No samples submitted.			
J	27.2	10.9	38.6	36.1
K	28.0	10.5	34.4	32.3
L	26.7	10.9	41.2	38.9
M	27.3	9.9	34.9	30.8
N	26.6	10.2	37.1	34.4
O	26.9	10.0	35.6	33.8
P	27.0	9.0	39.3	35.2
Q	26.8	10.1	37.5	34.8
R	26.5	11.0	36.8	33.6
S	No samples submitted.			
T	26.4	11.0	33.7	32.3
U	26.7	10.4	35.7	33.9
V	26.1	10.3	34.2	32.0
W	27.0	10.9	33.1	33.0
X	26.4	9.6	32.3	31.3
Current F.K.I. Average	27.1	10.4	35.3	33.1
Cumulative F.K.I. Average	27.1	10.3	35.2	36.1
F.K.I. Index, %	100.0	100.7	100.2	91.7

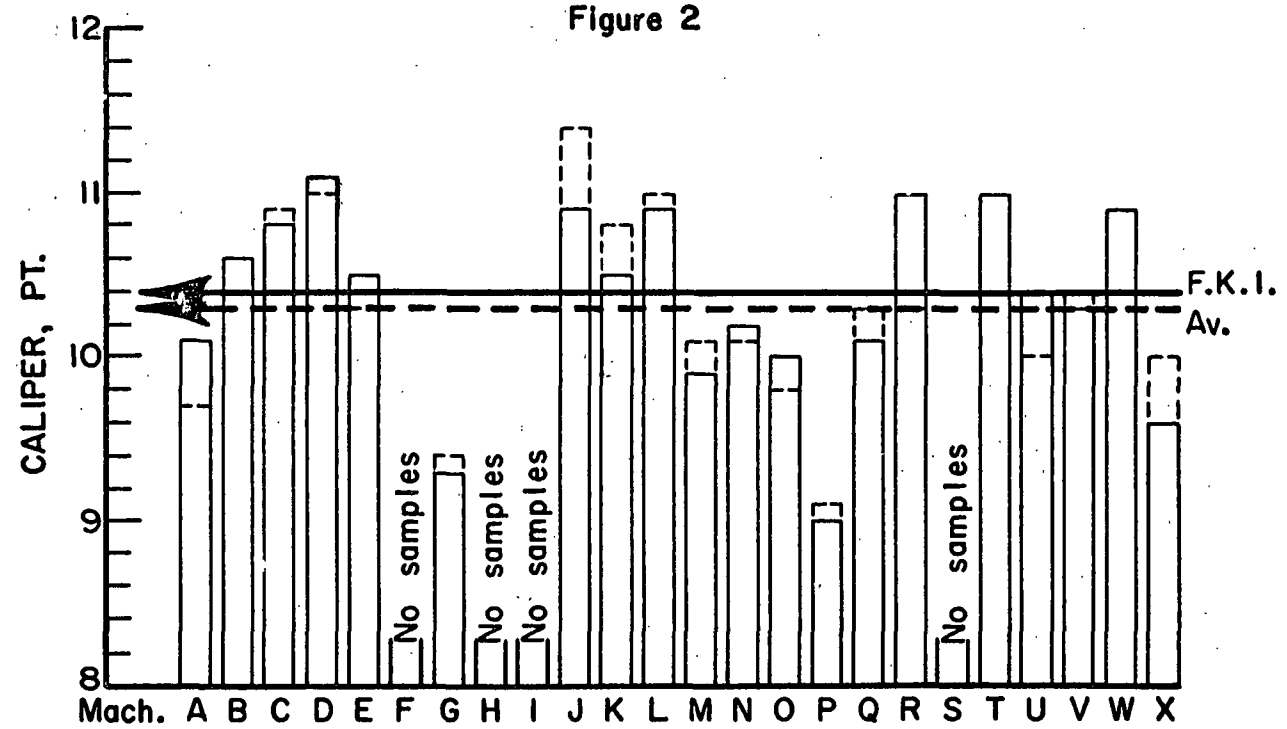
Figure 1



COMPARISON OF BASIS WEIGHT RESULTS

May, 1958

Figure 2



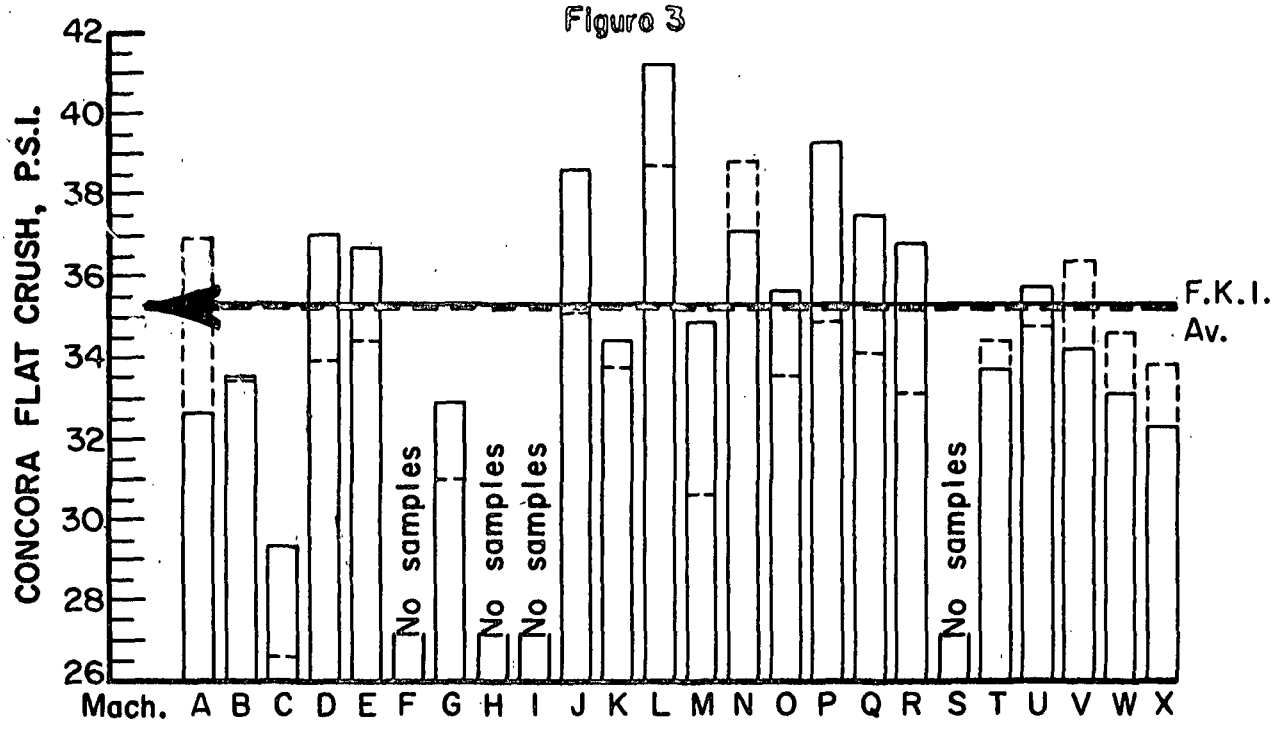
COMPARISON OF CALIPER RESULTS

May, 1958

——— Current machine average

- - - - - Cumulative machine average

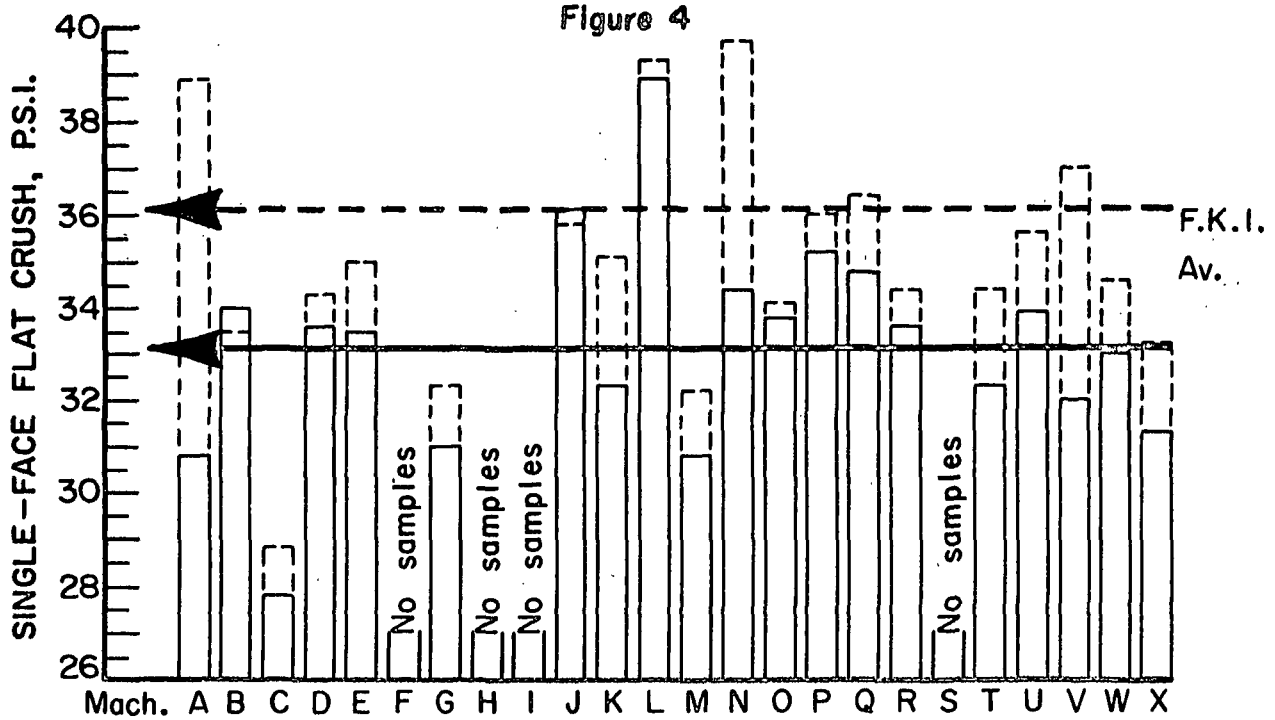
Figure 3



COMPARISON OF CONCORA FLAT CRUSH RESULTS

May, 1958

Figure 4



COMPARISON OF SINGLE-FACE FLAT CRUSH RESULTS

May, 1958

——— Current machine average

- - - - - Cumulative machine average

obtained for the various machines, Table II also presents the current F.K.I. averages, cumulative F.K.I. averages, and the F.K.I. indexes. The current F.K.I. average is the average of test results for all machines participating in the study during a given month. The cumulative F.K.I. average is based on the results for the previous twelve-month period excluding the result for the current period. The F.K.I. index is obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

The F.K.I. index provides a ready means of comparing the current quality with previous results. An index greater than 100% indicates that current quality is higher than the average result for the previous twelve periods; an index below 100% indicates that current quality is lower than the average result for the previous twelve periods.

The test results obtained on the sample lots submitted from the production of each of the machines are shown in Tables III through XXVI for Machines A through X, respectively. The maximum, minimum, and average test results obtained on each sample lot are shown for all tests except basis weight for which only the average is shown; in addition, the over-all average result for all sample lots submitted from a given machine is shown for each test. The latter over-all averages are reported as "current machine averages." A cumulative machine average is also shown and is calculated by averaging the current machine averages for the previous twelve periods (excluding the current period). Also shown for each machine in Tables III to XXVI are the machine factor and machine index which are defined as follows:

$$\frac{\text{current machine average}}{\text{cumulative machine average}} \times 100 = \text{machine factor (\%)}$$

$$\frac{\text{current machine average}}{\text{cumulative F.K.I. average}} \times 100 = \text{machine index (\%)}$$

The machine factor and machine index provide a means for comparing the current machine average with either the previous results for that particular machine or with the cumulative results for all machines--i.e., the cumulative F.K.I. average.

In Table II the current machine averages for the month of May are summarized. It may be noted that basis weight varied from a low of 26.1 lb. for Machine V to a high of 28.5 lb. for Machine D. The average basis weight for the twenty participating machines (current F.K.I. average) was 27.1 lb. per 1000 sq. ft., which is the same as the cumulative F.K.I. average. The average results for all machines satisfied the weight requirements of Rule 41.

Caliper results varied from a low value of 9.0 points for Machine P to a high value of 11.1 points for Machine D. The current F.K.I. average for caliper was 10.4 points, slightly higher than the cumulative F.K.I. average of 10.3 points, as reflected by the F.K.I. index of 100.7%. The average caliper results for all machines meet the Rule 41 specification.

Concora flat crush test results ranged from a minimum of 29.3 p.s.i. for Machine C to a maximum of 41.2 p.s.i. for Machine L. The current F.K.I. average was 35.3 p.s.i., slightly higher than the cumulative F.K.I. average of 35.2 p.s.i. as indicated by the F.K.I. index of 100.2%.

Machine L had the highest average single-face flat crush of 38.9 p.s.i., and Machine C had the lowest, 27.8 p.s.i. The current F.K.I. average for flat crush was 33.1 p.s.i., whereas the cumulative F.K.I. average was 36.1 p.s.i.

For the current period, the current F.K.I. average for basis weight was the same as the cumulative F.K.I. average, the current F.K.I. averages for caliper and Concora flat crush were slightly higher than their respective cumulative F.K.I. averages, and the current F.K.I. average for single-face flat crush was lower than its cumulative F.K.I. average.

The comparisons of Institute and mill Concora flat crush test results for the month of May are shown in Table XXVII. It may be recalled that interested participants now have the opportunity to submit the Concora flat crush test results which they obtained on the rolls submitted to The Institute of Paper Chemistry and thus may obtain information on how their results compare with the Institute's results. The agreement evident in Table XXVII is good in most instances. Where rather large differences exist, they may generally be attributed to significant differences in test procedure.

TABLE III

SUMMARY OF TEST RESULTS FOR MACHINE A
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
A-1	4-16-58	4-28-58	133	28.3	10.2	9.8	10.1	31.8	29.4	30.2	33.4	27.4	29.9	Satisfactory at 150 f.p.m.[a]
A-2	--	5-12-58	134	27.9	10.6	10.0	10.3	36.6	31.8	34.3	33.4	29.0	30.6	Satisfactory at 200 f.p.m.[a]
A-3	5- 1-58	5-12-58	135	28.6	10.7	9.8	10.0	36.6	31.2	33.4	36.4	28.6	31.9	Satisfactory at 600 f.p.m.[a]
Current Machine Average				28.3			10.1			32.6			30.8	
Cumulative Machine Average				28.4			9.7			36.9			38.9	
Machine Factor, %				99.4			104.5			88.4			79.2	
Machine Index, %				104.3			98.6			92.6			85.2	

TABLE IV

SUMMARY OF TEST RESULTS FOR MACHINE B
May, 1958

B-1	5- 7-58	5-15-58	41	27.8	10.8	10.5	10.7	36.6	33.0	34.2	36.0	35.2	35.6	Satisfactory at 600 f.p.m.[b]
B-2	5- 8-58	5-15-58	42	28.4	10.8	10.3	10.6	33.6	31.8	32.8	34.4	30.8	32.4	Satisfactory at 600 f.p.m.[b]
Current Machine Average				28.1			10.6			33.5			34.0	
Cumulative Machine Average				27.3			10.4			33.4			33.5	
Machine Factor, %				103.0			102.0			100.4			101.6	
Machine Index, %				103.8			103.3			95.0			94.0	

[a] With minimum tension.

[b] With tension of 1-1/2 lb./in.

TABLE V

SUMMARY OF TEST RESULTS FOR MACHINE C
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
C-1	4-22-58	5-22-58	2	27.7	11.2	10.4	10.9	33.6	31.2	32.4	32.2	30.0	31.2	Satisfactory at 600 f.p.m.[a]
C-2	4-26-58	5-22-58	3	27.7	11.0	10.8	10.9	39.0	32.4	35.3	31.8	29.2	30.7	Satisfactory at 600 f.p.m.[a]
C-3	5- 9-58	5-22-58	4	27.1	11.0	10.5	10.8	30.0	28.2	29.2	27.2	26.0	26.6	Satisfactory at 600 f.p.m.[a]
C-4	5-10-58	5-22-58	5	26.7	11.4	10.7	11.1	26.4	24.0	25.1	28.4	26.4	27.2	Satisfactory at 600 f.p.m.[a]
C-5	5-13-58	5-22-58	6	25.7	11.0	10.1	10.4	28.2	25.8	27.1	26.8	23.8	25.6	Satisfactory at 600 f.p.m.[a]
C-6	5-16-58	5-22-58	7	27.8	11.0	10.7	10.9	27.6	25.8	26.6	26.6	22.4	25.2	Satisfactory at 600 f.p.m.[a]
Current Machine Average				27.1			10.8			29.3			27.8	
Cumulative Machine Average				27.4			10.9			26.6			28.8	
Machine Factor, %				99.1			99.4			109.9			96.4	
Machine Index, %				100.1			105.1			83.1			76.8	

[a] With tension of 1 lb./in.

TABLE VI

SUMMARY OF TEST RESULTS FOR MACHINE D
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
D-1	4-30-58	5-12-58	39	28.4	11.1	10.7	10.9	40.2	36.6	37.7	35.8	31.8	34.2	Satisfactory at 600 f.p.m.[a]
D-2	4-30-58	5-12-58	40	28.5	11.5	11.0	11.2	38.4	34.8	36.4	34.8	31.0	33.0	Satisfactory at 600 f.p.m.[b]
Current Machine Average				28.5			11.1			37.0			33.6	
Cumulative Machine Average				28.2			11.0			33.9			34.3	
Machine Factor, %				100.8			101.1			109.1			97.8	
Machine Index, %				105.2			107.5			105.1			92.9	

TABLE VII

SUMMARY OF TEST RESULTS FOR MACHINE E
May, 1958

E-1	4-17-58	5-14-58	--	27.4	11.1	10.5	10.7	40.2	37.8	38.6	37.4	33.6	35.0	Satisfactory at 600 f.p.m.[b]
E-2	5- 7-58	5-14-58	1A	26.8	10.7	10.0	10.4	35.4	34.2	34.8	34.0	30.6	32.0	Satisfactory at 600 f.p.m.[b]
Current Machine Average				27.1			10.5			36.7			33.5	
Cumulative Machine Average				26.3			10.3			34.4			35.0	
Machine Factor, %				103.1			102.5			106.6			95.8	
Machine Index, %				100.0			102.4			104.2			92.8	

[a] With tension of 1 lb., in.
[b] With tension of 1/2 lb./in.

TABLE VIII

SUMMARY OF TEST RESULTS FOR MACHINE F
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
No samples submitted.														

TABLE IX

SUMMARY OF TEST RESULTS FOR MACHINE G
May, 1958

G-1	4-24-58	5-12-58	34	26.9	9.2	8.8	9.0	34.2	31.2	32.9	31.6	30.0	30.8	Satisfactory at 600 f.p.m.[a]
G-2	4-24-58	5-12-58	35	27.1	9.2	8.7	8.9	34.2	31.8	33.1	32.8	28.2	30.8	Satisfactory at 600 f.p.m.[a]
G-3	4-24-58	5-12-58	36	27.3	9.2	8.8	9.0	34.8	32.4	33.8	33.2	29.0	31.7	Satisfactory at 600 f.p.m.[a]
G-4	5- 6-58	5-16-58	37	28.6	10.1	9.4	9.8	34.2	32.4	33.1	32.8	27.8	29.5	Satisfactory at 600 f.p.m.[b]
G-5	5- 6-58	5-16-58	38	28.1	10.0	9.3	9.6	35.4	30.0	33.2	32.8	29.2	31.2	Satisfactory at 600 f.p.m.[b]
G-6	5- 6-58	5-16-58	39	28.5	10.1	9.1	9.7	33.0	29.4	31.1	33.4	29.2	31.6	Satisfactory at 600 f.p.m.[c]
Current Machine Average				27.7			9.3			32.9			31.0	
Cumulative Machine Average				27.3			9.4			31.0			32.3	
Machine Factor, %				101.6			99.4			106.1			95.8	
Machine Index, %				102.4			90.7			93.3			85.6	

[a] With tension of 1 lb./in.
[b] With minimum tension.
[c] With tension of 1/2 lb./in.

TABLE X

SUMMARY OF TEST RESULTS FOR MACHINE H
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
No samples submitted.														

TABLE XI

SUMMARY OF TEST RESULTS FOR MACHINE I
May, 1958

No samples submitted.

TABLE XII

SUMMARY OF TEST RESULTS FOR MACHINE J
May, 1958

J-1	4-25-58	5-12-58	675	27.7	11.8	10.8	11.4	42.6	35.4	40.1	39.0	33.8	36.0	Satisfactory at 600 f.p.m.[a]
J-2	5- 8-58	5-23-58	115	26.7	10.8	10.1	10.4	39.0	35.4	37.1	37.0	35.6	36.1	Satisfactory at 600 f.p.m.[b]
Current Machine Average				27.2			10.9			38.6			36.1	
Cumulative Machine Average				26.8			11.4			35.1			35.8	
Machine Factor, %				101.5			95.6			109.9			100.8	
Machine Index, %				100.6			106.0			109.5			99.8	

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1 lb./in.

TABLE XIII

SUMMARY OF TEST RESULTS FOR MACHINE K
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
K-1	4-22-58	4-25-58	156	28.0	10.6	10.0	10.3	35.4	33.0	34.2	34.8	31.6	33.3	Satisfactory at 600 f.p.m.[a]
K-2	4-24-58	4-28-58	157	27.9	11.0	10.1	10.5	34.2	32.4	33.2	34.0	30.8	32.6	Satisfactory at 600 f.p.m.[b]
K-3	4-30-58	5-12-58	157	27.6	10.7	9.5	10.2	33.6	31.2	32.6	33.8	30.0	31.4	Satisfactory at 600 f.p.m.[c]
K-4	4-30-58	5-12-58	159	28.1	10.8	10.2	10.6	35.4	30.6	33.0	32.4	29.2	31.0	Satisfactory at 600 f.p.m.[a]
K-5	5-6-58	5-12-58	160	27.7	11.6	10.5	11.0	36.0	28.8	33.5	31.4	27.0	29.7	Satisfactory at 600 f.p.m.[c]
K-6	5-8-58	5-12-58	161	28.6	11.5	10.9	11.1	37.8	34.2	36.2	34.8	32.2	33.2	Satisfactory at 600 f.p.m.[c]
K-7	5-13-58	5-16-58	162	29.0	10.7	10.1	10.3	39.0	36.6	38.2	36.8	32.6	34.1	Satisfactory at 600 f.p.m.[c]
K-8	5-20-58	5-23-58	164	27.4	10.2	9.7	10.0	34.2	33.6	34.1	33.8	30.6	32.8	Satisfactory at 600 f.p.m.[b]
Current Machine Average				28.0			10.5			34.4			32.3	
Cumulative Machine Average				28.7			10.8			33.7			35.1	
Machine Factor, %				97.6			96.8			102.0			92.0	
Machine Index, %				103.5			101.9			97.6			89.3	

[a] With tension of 1/2 lb./in.
[b] With tension of 1 lb./in.
[c] With tension of 1-1/2 lb./in.

TABLE XIV

SUMMARY OF TEST RESULTS FOR MACHINE L
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
L-1	4-22-58	4-25-58	365	26.9	10.8	10.0	10.3	40.8	37.8	39.5	38.6	37.0	37.9	Satisfactory at 600 f.p.m.[a]
L-2	4-25-58	4-29-58	366	26.5	11.5	10.8	11.2	36.6	35.4	36.0	36.2	32.4	34.8	Satisfactory at 600 f.p.m.[a]
L-3	4-29-58	5-12-58	367	26.8	11.3	10.7	11.0	45.6	41.4	43.2	42.4	39.2	41.0	Satisfactory at 600 f.p.m.[b]
L-4	5- 7-58	5-12-58	368	26.9	11.1	10.6	10.9	46.2	39.0	42.2	40.2	38.4	39.6	Satisfactory at 600 f.p.m.[c]
L-5	5- 9-58	5-13-58	369	26.4	10.9	10.2	10.6	43.8	39.0	41.3	39.6	37.0	38.2	Satisfactory at 600 f.p.m.[c]
L-6	5-14-58	5-19-58	370	27.0	11.4	10.5	11.0	46.8	40.8	43.6	41.8	39.0	40.2	Satisfactory at 600 f.p.m.[c]
L-7	5-16-58	5-22-58	371	26.7	11.5	10.8	11.0	45.0	40.2	42.4	41.0	39.0	40.4	Satisfactory at 600 f.p.m.[c]
Current Machine Average				26.7			10.9			41.2			38.9	
Cumulative Machine Average				26.6			11.0			38.7			39.3	
Machine Factor, %				100.3			98.5			106.3			98.9	
Machine Index, %				98.8			105.6			116.9			107.6	

[a] Withltension of 1/2 lb./in.
[b] With tension of 1-1/2 lb./in.
[c] With tension of 1 lb./in.

TABLE XV

SUMMARY OF TEST RESULTS FOR MACHINE M
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
M-1	4-23-58	5-16-58	23	27.3	10.4	8.7	9.9	37.8	31.2	34.9	31.8	29.6	30.8	Satisfactory at 300 f.p.m.[a]
Current Machine Average				27.3			9.9			34.9			30.8	
Cumulative Machine Average				26.6			10.1			30.6			32.2	
Machine Factor, %				102.6			98.2			114.2			95.8	
Machine Index, %				100.9			95.9			99.1			85.3	

TABLE XVI

SUMMARY OF TEST RESULTS FOR MACHINE N
May, 1958

N-1	4-18-58	4-28-58	216	26.3	11.0	10.7	10.9	37.8	33.6	35.3	34.8	32.2	33.8	Satisfactory at 600 f.p.m.[b]
N-2	4-21-58	4-28-58	217	26.8	10.3	10.0	10.1	36.6	34.8	36.0	38.2	34.2	35.5	Satisfactory at 600 f.p.m.[b]
N-3	5- 6-58	5-12-58	218	26.5	10.5	10.0	10.1	37.8	34.8	36.8	34.6	32.2	33.4	Satisfactory at 600 f.p.m.[c]
N-4	5-10-58	5-16-58	219	26.9	10.2	9.8	10.0	39.6	34.8	37.9	36.4	34.4	35.7	Satisfactory at 600 f.p.m.[c]
N-5	5-13-58	5-19-58	220	26.1	9.9	9.4	9.7	39.6	36.0	37.8	37.4	31.8	34.0	Satisfactory at 600 f.p.m.[c]
N-6	5-15-58	5-21-58	221	27.2	10.7	10.0	10.3	40.8	37.8	38.9	35.2	33.2	34.0	Satisfactory at 600 f.p.m.[c]
Current Machine Average				26.6			10.2			37.1			34.4	
Cumulative Machine Average				27.1			10.1			38.8			39.7	
Machine Factor, %				98.4			100.9			95.6			86.6	
Machine Index, %				98.4			98.8			105.4			95.2	

[a] With minimum tension.
[b] With tension of 1/2 lb./in.
[c] With tension of 1-1/2 lb./in.

TABLE XVII

SUMMARY OF TEST RESULTS FOR MACHINE O
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
O-1	4- 7-58	4-30-58	--	25.8	9.9	9.5	9.8	35.4	32.4	34.1	33.4	30.0	31.9	Satisfactory at 600 f.p.m.[a]
O-2	4- 8-58	4-30-58	--	27.9	10.5	10.0	10.2	39.0	35.4	37.1	36.8	34.4	35.7	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.9			10.0			35.6			33.8	
Cumulative Machine Average				26.2			9.8			33.5			34.1	
Machine Factor, %				102.7			101.7			106.3			99.0	
Machine Index, %				99.3			97.1			101.0			93.5	

TABLE XVIII

SUMMARY OF TEST RESULTS FOR MACHINE P
May, 1958

P-1	5- 3-58	5-12-58	175	27.2	9.4	9.0	9.2	40.2	36.0	38.6	37.4	34.4	35.8	Satisfactory at 600 f.p.m.[a]
P-2	5-11-58	5-16-58	176	26.3	9.1	8.6	8.8	42.0	37.8	40.1	37.4	33.8	35.6	Satisfactory at 600 f.p.m.[b]
P-3	5-11-58	5-16-58	177	27.4	9.3	8.8	9.1	42.0	34.8	39.1	36.0	33.2	34.2	Satisfactory at 600 f.p.m.[c]
Current Machine Average				27.0			9.0			39.3			35.2	
Cumulative Machine Average				26.9			9.1			34.9			36.0	
Machine Factor, %				100.1			98.8			112.6			97.8	
Machine Index, %				99.6			87.6			111.5			97.4	

[a] With tension of 1-1/2 lb./in.
[b] With minimum tension
[c] With tension of 1 lb./in.

TABLE XIX

SUMMARY OF TEST RESULTS FOR MACHINE Q
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
Q-1	4-24-58	4-30-58	37	27.3	10.8	9.7	10.5	41.4	35.4	37.8	36.4	34.0	35.0	Satisfactory at 600 f.p.m.[a]
Q-2	4-24-58	4-30-58	38	26.8	10.4	9.8	10.1	39.0	33.6	36.0	36.0	33.4	34.6	Satisfactory at 600 f.p.m.[a]
Q-3	5-16-58	5-20-58	43	26.5	10.2	9.1	9.8	39.0	33.6	35.8	35.4	31.8	34.0	Satisfactory at 600 f.p.m.[b]
Q-4	5-16-58	5-20-58	44	26.8	10.0	9.0	9.7	42.6	38.4	40.3	37.4	33.6	35.5	Satisfactory at 600 f.p.m.[c]
Current Machine Average				26.8			10.1			37.5			34.8	
Cumulative Machine Average				27.3			10.3			34.1			36.4	
Machine Factor, %				98.4			97.9			110.0			95.5	
Machine Index, %				99.1			97.7			106.3			96.3	

TABLE XX

SUMMARY OF TEST RESULTS FOR MACHINE R
May, 1958

R-1	4-18-58	5-14-58	--	26.8	11.2	10.6	11.0	42.0	37.2	39.8	37.4	34.6	35.6	Satisfactory at 600 f.p.m.[a]
R-2	5- 2-58	5-14-58	1B	26.5	11.3	11.0	11.2	34.2	31.8	33.6	34.0	30.6	32.3	Satisfactory at 600 f.p.m.[b]
R-3	5-8- 58	5-14-58	2B	26.3	11.2	10.6	11.0	39.0	35.4	37.1	34.0	32.0	33.0	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.5			11.0			36.8			33.6	
Cumulative Machine Average				26.2			10.3			33.1			34.4	
Machine Factor, %				101.4			106.8			111.4			97.9	
Machine Index, %				98.0			107.4			104.6			93.0	

[a] With tension of 1/2 lb./in.
[b] With tension of 1 lb./in.
c With tension of 1-1/2 lb./in.

TABLE XXI

SUMMARY OF TEST RESULTS FOR MACHINE S
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
No samples submitted.														

TABLE XXII

SUMMARY OF TEST RESULTS FOR MACHINE T
May, 1958

T-1	4-30-58	5-14-58	--	26.4	11.2	10.7	10.9	36.0	33.0	33.7	32.6	30.4	31.8	Satisfactory at 600 f.p.m.[a]
T-2	5- 9-58	5-14-58	--	26.3	11.3	10.9	11.1	36.0	31.8	33.7	34.6	30.6	32.7	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.4			11.0			33.7			32.3	
Cumulative Machine Average				26.5			10.4			34.4			34.4	
Machine Factor, %				99.4			106.3			97.9			93.8	
Machine Index, %				97.3			106.9			95.7			89.3	

[a] With minimum tension.

TABLE XXIII

SUMMARY OF TEST RESULTS FOR MACHINE U
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
U-1	4-21-58	4-28-58	81	27.2	10.1	9.9	10.0	34.2	30.6	32.6	36.0	34.6	35.5	Satisfactory at 600 f.p.m.[a]
U-2	5- 1-58	5-12-58	82	26.5	11.2	10.4	10.9	38.4	31.2	35.0	34.0	31.4	32.6	Satisfactory at 600 f.p.m.[b]
U-3	5- 3-58	5-12-58	83	26.3	10.8	10.0	10.3	40.2	33.6	37.4	33.8	30.6	32.6	Satisfactory at 600 f.p.m.[b]
U-4	5- 7-58	5-19-58	84	26.7	10.8	10.0	10.4	39.0	34.8	35.8	34.0	30.6	32.1	Satisfactory at 600 f.p.m.[b]
U-5	5- 8-58	5-19-58	85	27.4	11.0	10.3	10.7	42.0	36.6	39.1	38.8	35.0	36.6	Satisfactory at 600 f.p.m.[a]
U-6	5-14-58	5-23-58	86	26.3	10.8	9.8	10.3	35.4	31.8	33.8	37.2	31.8	33.7	Satisfactory at 600 f.p.m.[a]
U-7	5-15-58	5-23-58	87	26.7	10.7	10.0	10.3	39.0	34.8	36.2	34.8	33.4	34.2	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.7			10.4			35.7			33.9	
Cumulative Machine Average				26.4			10.0			34.8			35.6	
Machine Factor, %				101.1			104.1			102.6			95.1	
Machine Index, %				98.7			101.2			101.4			93.8	

[a] With tension of 1-1/2 lb./in.

[b] With tension of 1 lb./in.

TABLE XXIV

SUMMARY OF TEST RESULTS FOR MACHINE V
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
V-1	4-24-58	4-28-58	164	26.6	10.7	10.2	10.5	37.8	32.4	34.2	36.0	34.0	35.0	Satisfactory at 600 f.p.m.[a]
V-2	5- 6-58	5-12-58	165	26.2	10.7	10.0	10.2	39.6	34.2	36.2	34.4	31.8	33.5	Satisfactory at 600 f.p.m.[b]
V-3	5- 8-58	5-13-58	166	26.3	10.9	10.3	10.6	37.2	33.0	35.0	34.8	32.2	33.6	Satisfactory at 600 f.p.m.[c]
V-4	--	5-19-58	167	25.9	10.1	9.7	9.9	36.6	33.6	35.4	34.4	28.6	31.4	Satisfactory at 600 f.p.m.[a]
V-5	--	5-19-58	168	25.7	10.6	10.2	10.4	32.4	27.0	30.1	27.4	25.8	26.6	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.1			10.3			34.2			32.0	
Cumulative Machine Average				26.7			10.4			36.4			37.0	
Machine Factor, %				97.8			99.1			94.0			86.4	
Machine Index, %				96.6			100.2			97.1			88.5	

[a] With tension of 1/2 lb./in.

[b] With tension of 1 lb./in.

[c] With minimum tension.

TABLE XXV

SUMMARY OF TEST RESULTS FOR MACHINE W
May, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
W-1	4-14-58	4-28-58	20	27.0	11.4	10.3	10.9	35.4	31.8	33.1	34.6	30.4	33.0	Satisfactory at 600 f.p.m.[a]
Current Machine Average				27.0			10.9			33.1			33.0	
Cumulative Machine Average				27.1			10.9			34.6			34.6	
Machine Factor, %				99.5			100.0			95.8			95.2	
Machine Index, %				99.8			105.7			94.0			91.2	

TABLE XXVI

SUMMARY OF TEST RESULTS FOR MACHINE X
May, 1958

X-1	4-10-58	4-30-58	—	26.2	10.0	9.3	9.7	33.0	30.0	32.2	31.4	28.2	29.7	Satisfactory at 600 f.p.m.[b]
X-2	4-10-58	4-30-58	—	26.6	10.0	9.2	9.6	34.2	30.6	32.4	34.4	32.2	32.8	Satisfactory at 600 f.p.m.[b]
Current Machine Average				26.4			9.6			32.3			31.3	
Cumulative Machine Average				26.5			10.0			33.8			33.2	
Machine Factor, %				99.5			95.8			95.4			94.1	
Machine Index, %				97.6			93.5			91.6			86.5	

[a] With tension at 1 lb./in.

[b] With tension at 1/2 lb./in.

TABLE XXVII

COMPARISON OF INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS FOR MAY, 1958

Machine B

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
B-1	41	5- 7-58	34.2	40.2	+6.0
B-2	42	5- 8-58	32.8	32.8	0.0

Machine D

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
D-1	39	4-30-58	37.7	39.2	+1.5
D-2	40	4-30-58	36.4	38.1	+1.7

Machine G

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
G-1	34	4-24-58	32.9	36.0	+3.1
G-2	35	4-24-58	33.1	36.7	+3.6
G-3	36	4-24-58	33.8	35.6	+1.8
G-4	37	5- 6-58	33.1	36.8	+3.7
G-5	38	5- 6-58	33.2	35.8	+2.6
G-6	39	5- 6-58	31.1	35.5	+4.4

Machine J

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
J-1	675	4-25-58	40.1	39.6	-0.5
J-2	115	5- 8-58	37.1	39.7	+2.6

Machine L

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
L-1	365	4-22-58	39.5	42.4	+2.9
L-2	366	4-25-58	36.0	38.6	+2.6
L-3	367	4-29-58	43.2	44.5	+1.3
L-4	368	5- 7-58	42.2	43.3	+1.1
L-5	369	5- 9-58	41.3	40.7	-0.6
L-6	370	5-14-58	43.6	40.8	-2.8
L-7	371	5-16-58	42.4	46.1	+3.7

Machine M

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
M-1	23	4-23-58	34.9	34.8	-0.1

Machine N

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
N-1	216	4-18-58	35.3	37.6	+2.3
N-2	217	4-21-58	36.0	38.5	+2.5
N-3	218	5- 6-58	36.8	37.0	+0.2
N-4	219	5-10-58	37.9	37.7	-0.2
N-5	220	5-13-58	37.8	40.2	+2.4
N-6	221	5-15-58	38.9	36.5	-2.4

Machine O

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
O-1	—	4- 7-58	34.1	38.2	+4.1
O-2	—	4- 8-58	37.1	42.8	+5.7

Machine Q

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
Q-1	37	4-24-58	37.8	35.6	-2.2
Q-2	38	4-24-58	36.0	33.0	-3.0
Q-3	43	5-16-58	35.8	38.6	+2.8
Q-4	44	5-16-58	40.3	36.5	-3.8

Machine U

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
U-1	81	4-21-58	32.6	39.1	+6.5
U-2	82	5- 1-58	35.0	38.8	+3.8
U-3	83	5- 3-58	37.4	43.2	+5.8
U-4	84	5- 7-58	35.8	41.5	+5.7
U-5	85	5- 8-58	39.1	42.4	+3.3
U-6	86	5-14-58	33.8	42.7	+8.9
U-7	87	5-15-58	36.2	41.2	+5.0

Machine V

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
V-1	164	4-24-58	34.2	39.5	+5.3
V-2	165	5- 6-58	36.2	37.4	+1.2
V-3	166	5- 8-58	35.0	39.2	+4.2
V-4	167	—	35.4	—	—
V-5	168	—	30.1	—	—

Machine W

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
W-1	20	4-14-58	33.1	30.9	-2.2

Machine X

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
X-1	—	4-10-58	32.2	38.0	+5.8
X-2	—	4-10-58	32.4	37.4	+5.0

PART III

RESULTS FOR JUNE 1-30

During the month of June, one hundred and two rolls of corrugating medium were selected from the production of eighteen machines and submitted to The Institute of Paper Chemistry for evaluation. A tabulation of the number of rolls submitted from each machine is given in Table I.

TABLE I

DISTRIBUTION OF CORRUGATING MEDIUM SAMPLES

Machine Code	Number of Samples
A	0
B	7
C	8
D	4
E	2
F	6
G	4
H	6
I	0
J	8
K	2
L	4
M	9
N	0
O	0
P	0
Q	4
R	7
S	1
T	8
U	9
V	8
W	5
X	0
Total	102

Each sample of corrugating medium was evaluated for basis weight, caliper, Concora flat crush, H. and D. flat crush (single-faced board), and runability. Runability was measured by corrugating each roll under standardized conditions on the Institute's corrugator into A-flute board at 600 feet per minute with minimum tension. If unsatisfactory runability occurred at this speed, the corrugator was slowed down in increments of 25 f.p.m. until satisfactory runability was obtained (no ruptured flutes). If the medium fabricated satisfactorily at 600 f.p.m. with minimum tension, further runs were made at higher tensions to determine when cracking occurred. The higher tensions used were 0.5 lb. per inch, 1.0 lb. per inch, and 1.5 lb. per inch.

Flat crush was determined on the board obtained at the highest speed with minimum tension. In addition to information about quality, these results will provide data which may be useful in studying the relationship between Concora flat crush and combined board flat crush for each participant's medium.

As requested by members of the F.K.B.I., the Concora medium test results are calculated on the basis of pounds of load per unit area rather than on the basis of the formula suggested by the Concora manufacturer and are reported as Concora flat crush test results. In Progress Reports One and Two, the Concora medium test results were reported on the basis of the formula suggested by the Concora manufacturer.

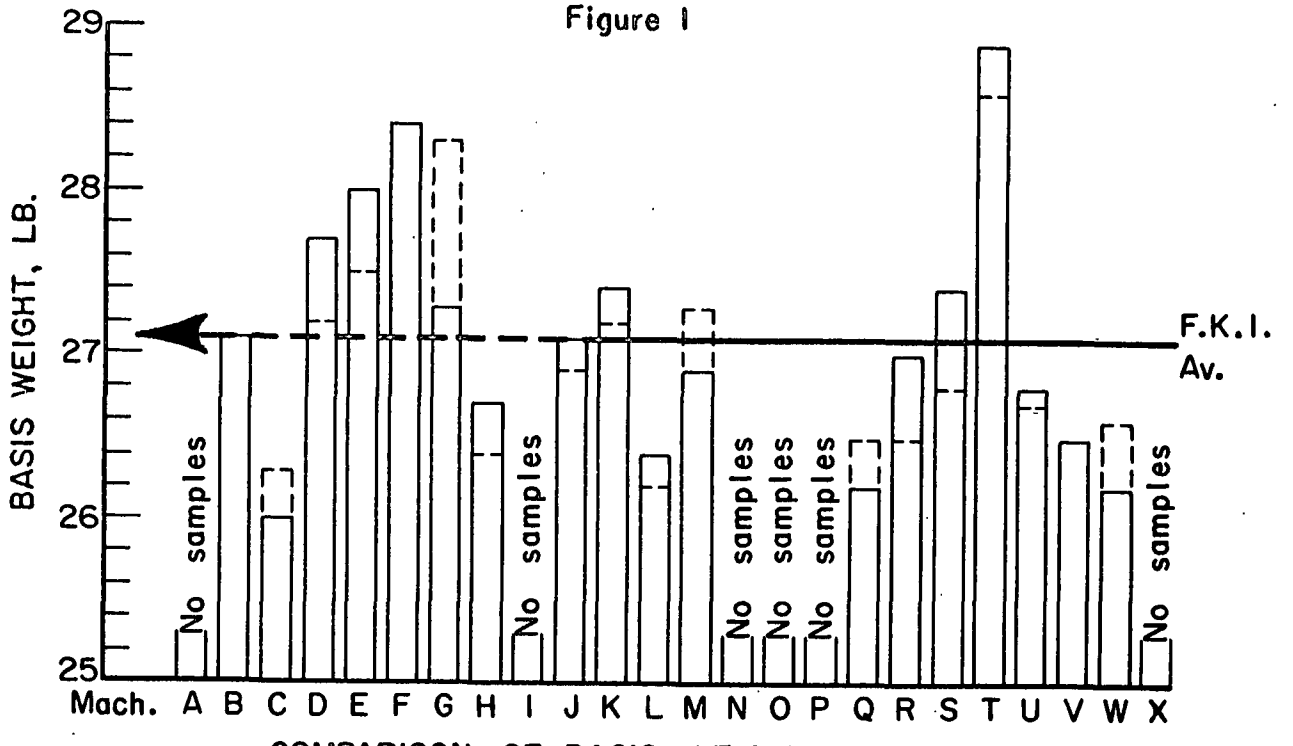
The average test results obtained on the samples of corrugating medium submitted by each participant are shown in Table II and graphically presented in Figures 1 to 4. In addition to a comparison of the test data

TABLE II

SUMMARY OF CURRENT MACHINE AVERAGES
June, 1958

Mill Code	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A		No samples submitted.		
B	27.1	10.2	37.0	34.9
C	26.0	9.5	34.1	32.8
D	27.7	11.0	29.2	27.6
E	28.0	11.0	30.7	31.2
F	28.4	9.9	33.7	31.8
G	27.3	10.9	31.1	29.4
H	26.7	10.2	36.2	32.9
I		No samples submitted.		
J	27.1	9.1	35.4	33.3
K	27.4	10.1	33.4	31.0
L	26.4	10.6	35.4	34.0
M	26.9	8.9	30.8	30.2
N		No samples submitted.		
O		No samples submitted.		
P		No samples submitted.		
Q	26.2	10.4	35.1	32.5
R	27.0	10.6	34.1	33.6
S	27.4	11.1	41.8	37.2
T	28.9	10.9	33.8	32.1
U	26.8	11.0	40.3	36.5
V	26.5	9.8	33.3	31.9
W	26.2	10.0	36.7	33.5
X		No samples submitted.		
Current F.K.I. Average	27.1	10.3	34.6	32.6
Cumulative F.K.I. Average	27.1	10.3	35.2	35.8
F.K.I. Index, %	10.0	100.0	98.2	91.0

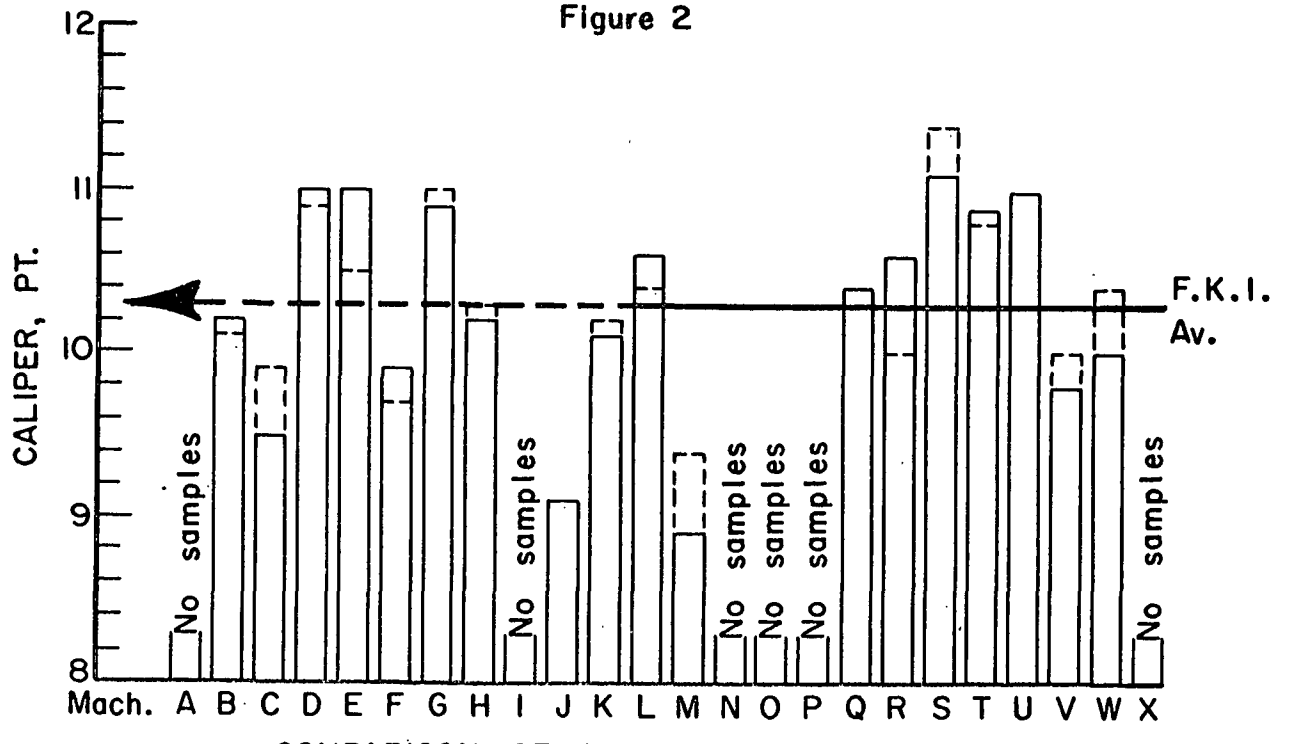
Figure 1



COMPARISON OF BASIS WEIGHT RESULTS

June, 1958

Figure 2



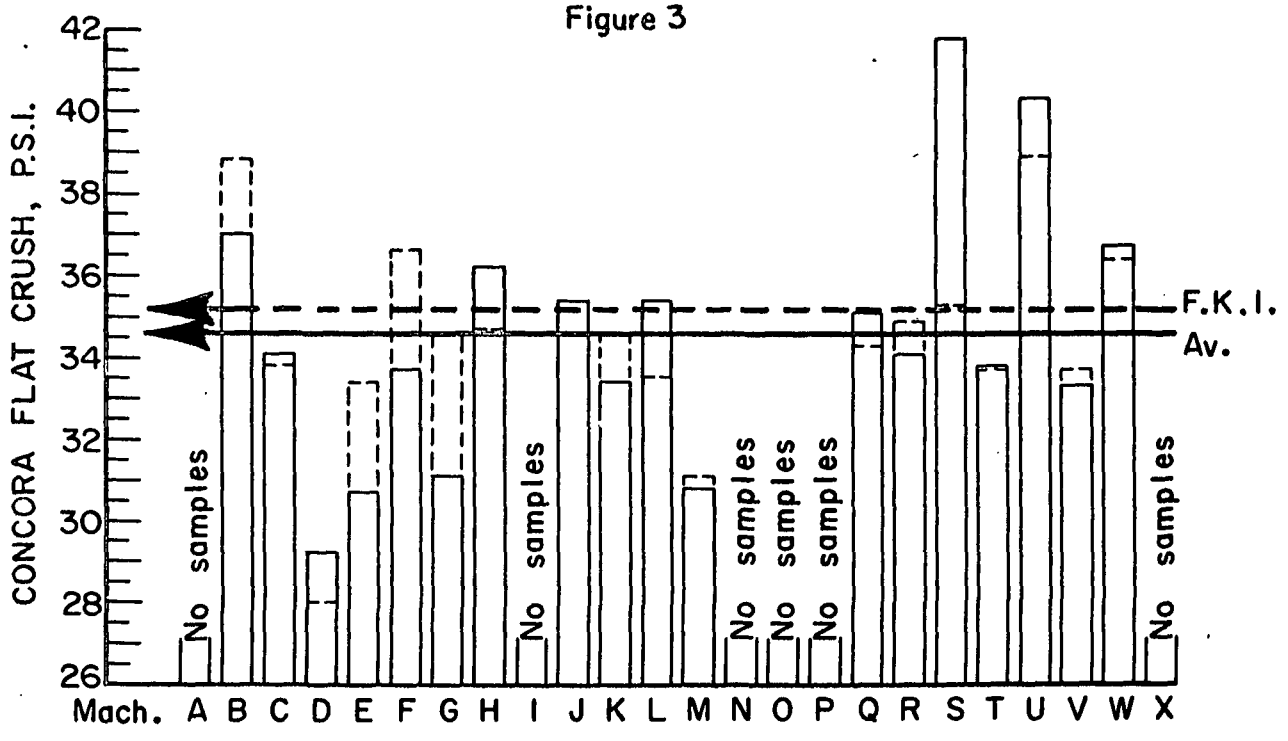
COMPARISON OF CALIPER RESULTS

June, 1958

——— Current machine average

– – – – – Cumulative machine average

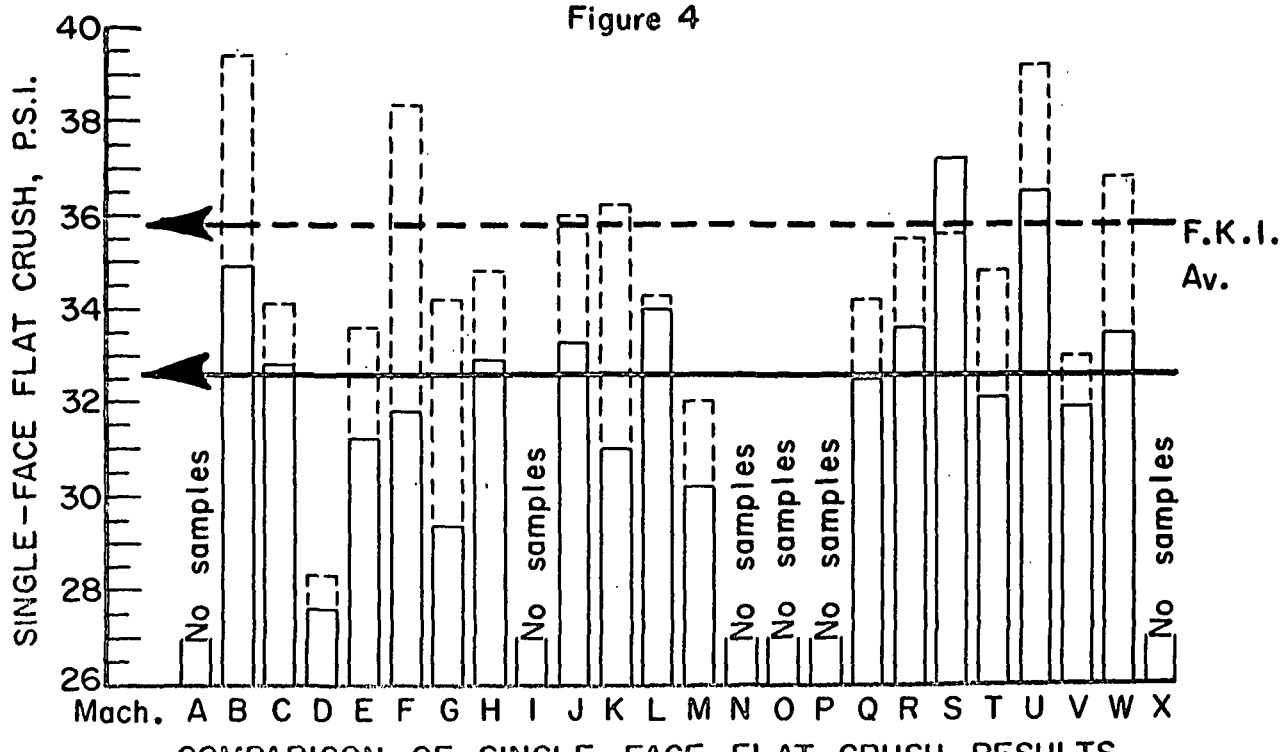
Figure 3



COMPARISON OF CONCORA FLAT CRUSH RESULTS

June, 1958

Figure 4



COMPARISON OF SINGLE-FACE FLAT CRUSH RESULTS

June, 1958

——— Current machine average

– – – – – Cumulative machine average

obtained for the various machines, Table II also presents the current F.K.I. averages, cumulative F.K.I. averages, and the F.K.I. indexes. The current F.K.I. average is the average of test results for all machines participating in the study during a given month. The cumulative F.K.I. average is based on the results for the previous twelve-month period excluding the result for the current period. The F.K.I. index is obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

The F.K.I. index provides a ready means of comparing the current quality with previous results. An index greater than 100% indicates that current quality is higher than the average result for the previous twelve periods; an index below 100% indicates that current quality is lower than the average result for the previous twelve periods.

The test results obtained on the sample lots submitted from the production of each of the machines are shown in Tables III through XXVI for Machines A through X, respectively. The maximum, minimum, and average test results obtained on each sample lot are shown for all tests except basis weight for which only the average is shown; in addition, the over-all average result for all sample lots submitted from a given machine is shown for each test. The latter over-all averages are reported as "current machine averages." A cumulative machine average is also shown and is calculated by averaging the current machine averages for the previous twelve periods (excluding the current period). Also shown for each machine in Tables III to XXVI are the machine factor and machine index which are defined as follows:

$$\frac{\text{current machine average}}{\text{cumulative machine average}} \times 100 = \text{machine factor (\%)}$$

$$\frac{\text{current machine average}}{\text{cumulative F.K.I. average}} \times 100 = \text{machine index (\%)}$$

The machine factor and machine index provide a means for comparing the current machine average with either the previous results for that particular machine or with the cumulative results for all machines--i.e., the cumulative F.K.I. average.

In Table II the current machine averages for the month of June are summarized. It may be noted that basis weight varied from a low of 26.0 lb. for Machine C to a high of 28.9 lb. for Machine T. The average basis weight for the eighteen participating machines (current F.K.I. average) was 27.1 lb. per 1000 sq. ft., which is the same as the cumulative F.K.I. average. The average results for all machines satisfied the weight requirements of Rule 41.

Caliper results varied from a low value of 8.9 points for Machine M to a high value of 11.1 points for Machine S. The current F.K.I. average for caliper was 10.3 points, the same as the cumulative F.K.I. average. The average caliper results for all machines except M meet the Rule 41 specification.

Concora flat crush test results ranged from a minimum of 29.2 p.s.i. for Machine D to a maximum of 41.8 p.s.i. for Machine S. The current F.K.I. average was 34.6 p.s.i., slightly lower than the cumulative F.K.I. average of 35.2 p.s.i. as indicated by the F.K.I. index of 98.2%.

Machine S had the highest average single-face flat crush of 37.2 p.s.i., and Machine D had the lowest, 27.6 p.s.i. The current F.K.I. average for flat crush was 32.6 p.s.i., whereas the cumulative F.K.I. average was 35.8 p.s.i.

For the current period, the current F.K.I. averages for basis weight and caliper were the same as their respective cumulative F.K.I. averages and the current F.K.I. averages for Concora flat crush and single-face flat crush were lower than their respective cumulative F.K.I. averages.

The comparisons of Institute and mill Concora flat crush test results for the month of June are shown in Table XXVII. It may be recalled that interested participants now have the opportunity to submit the Concora flat crush test results which they obtained on the rolls submitted to The Institute of Paper Chemistry and thus may obtain information on how their results compare with the Ins titute's results. The agreement evident in Table XXVII is good in most instances. Where rather large differences exist, they may generally be attributed to significant differences in test procedure.

TABLE III

SUMMARY OF TEST RESULTS FOR MACHINE A
June, 1958

Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
				Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	

No samples submitted.

TABLE IV

SUMMARY OF TEST RESULTS FOR MACHINE B
June, 1958

B-1	5-20-58	5-26-58	222	26.7	10.8	10.0	10.3	40.2	35.4	37.4	38.0	33.6	35.6	Satisfactory at 600 f.p.m.[a]
B-2	5-23-58	6- 2-58	223	27.4	10.9	10.0	10.4	37.2	31.8	35.2	39.4	32.2	35.4	Satisfactory at 600 f.p.m.[a]
B-3	5-30-58	6-10-58	224	26.9	10.7	10.0	10.3	37.2	31.8	34.1	35.2	30.2	32.6	Satisfactory at 600 f.p.m.[a]
B-4	6- 3-58	6-11-58	225	27.4	10.2	9.9	10.1	42.0	37.8	40.0	37.2	34.0	35.9	Satisfactory at 600 f.p.m.[b]
B-5	6- 5-58	6-11-58	226	27.6	10.9	9.9	10.4	40.2	37.8	39.2	35.8	33.0	35.0	Satisfactory at 600 f.p.m.[b]
B-6	6-10-58	6-16-58	227	26.8	10.5	10.0	10.2	38.4	33.0	36.8	35.4	33.2	34.7	Satisfactory at 600 f.p.m.[b]
B-7	6-12-58	6-23-58	228	26.9	10.2	9.8	10.1	37.8	34.2	36.4	36.4	34.0	35.4	Satisfactory at 600 f.p.m.[b]
Current Machine Average				27.1			10.2			37.0			34.9	-
Cumulative Machine Average				27.1			10.1			38.8			39.4	
Machine Factor, %				100.0			101.3			95.5			88.6	
Machine Index, %				100.1			99.4			105.2			97.5	

[a] With tension of 1 lb./in.
[b] With tension of 1-1/2 lb./in.

TABLE V

SUMMARY OF TEST RESULTS FOR MACHINE C
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
C-1	4-23-58	5-26-58	--	26.0	10.0	9.3	9.6	34.8	30.6	32.9	32.8	26.8	30.8	Satisfactory at 600 f.p.m.[a]
C-2	4-26-58	5-26-58	--	25.4	9.8	9.0	9.5	34.2	31.8	33.5	32.2	29.8	30.8	Satisfactory at 600 f.p.m.[a]
C-3	5- 7-58	5-29-58	--	26.0	9.4	9.1	9.2	34.8	33.0	34.1	35.2	31.4	33.6	Satisfactory at 600 f.p.m.[a]
C-4	5-10-58	5-29-58	--	26.9	9.8	9.2	9.5	36.0	33.6	34.7	36.6	33.6	35.0	Satisfactory at 600 f.p.m.[a]
C-5	5-14-58	6- 3-58	--	25.5	9.9	9.2	9.5	31.8	31.2	31.7	33.4	30.6	31.6	Satisfactory at 600 f.p.m.[a]
C-6	5-16-58	6- 3-58	-	25.8	10.0	9.7	9.9	37.8	35.4	36.7	33.8	32.4	33.2	Satisfactory at 600 f.p.m.[a]
C-7	6- 2-58	6-24-58	--	25.9	9.8	9.1	9.4	34.8	32.4	34.0	33.8	31.2	32.3	Satisfactory at 600 f.p.m.[a]
C-8	6- 3-58	6-24-58	--	26.5	9.6	9.2	9.3	36.6	33.6	35.0	35.6	33.8	35.0	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.0			9.5			34.1			32.8	
Cumulative Machine Average				26.3			9.9			33.8			34.1	
Machine Factor, %				98.9			96.3			100.9			96.2	
Machine Index, %				96.1			92.1			96.8			91.5	

[a] With tension of 1-1/2 lb./in.

TABLE VI

SUMMARY OF TEST RESULTS FOR MACHINE D
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
D-1	--	6-16-58	8	26.8	11.0	10.5	10.9	31.8	28.8	30.5	29.4	25.2	26.7	Satisfactory at 600 f.p.m.[a]
D-2	--	6-16-58	9	28.1	11.5	11.0	11.3	32.4	26.4	30.4	29.2	26.0	27.2	Satisfactory at 600 f.p.m.[a]
D-3	--	6-16-58	10	28.0	11.2	10.9	11.0	28.8	28.2	28.6	29.4	25.8	28.4	Satisfactory at 600 f.p.m.[a]
D-4	--	6-16-58	11	27.9	10.9	10.6	10.8	30.6	25.8	27.6	29.6	26.2	28.1	Satisfactory at 600 f.p.m.[b]
Current Machine Average				27.7			11.0			29.2			27.6	
Cumulative Machine Average				27.2			10.9			28.0			28.3	
Machine Factor, %				101.7			101.2			104.6			97.5	
Machine Index, %				102.3			106.7			83.1			77.0	

TABLE VII

SUMMARY OF TEST RESULTS FOR MACHINE E
June, 1958

E-1	5-29-58	6-10-58	47	27.9	10.9	10.4	10.8	30.0	28.8	29.4	31.0	29.8	30.2	Satisfactory at 600 f.p.m.[c]
E-2	5-30-58	6-10-58	48	28.1	11.8	11.0	11.2	34.2	29.4	32.0	33.6	30.8	32.2	Satisfactory at 600 f.p.m.[b]
Current Machine Average				28.0			11.0			30.7			31.2	
Cumulative Machine Average				27.5			10.5			33.4			33.6	
Machine Factor, %				102.1			105.1			92.0			93.1	
Machine Index, %				103.6			106.8			87.3			87.2	

[a] With minimum tension.
[b] With tension of 1/2 lb./in.
[c] With tension of 1 lb./in.

TABLE VIII

SUMMARY OF TEST RESULTS FOR MACHINE F
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
F-1	5-13-58	6- 2-58	136	28.7	10.7	9.3	10.1	38.4	33.0	35.3	35.8	31.8	33.5	Satisfactory at 100 f.p.m.[a]
F-2	--	6- 2-58	137	27.4	9.8	9.0	9.4	33.6	28.2	31.3	33.8	29.0	30.7	Satisfactory at 150 f.p.m.[a]
F-3	5-30-58	6-23-58	138	29.5	10.9	10.0	10.6	38.4	31.2	34.6	28.6	24.4	27.4	Satisfactory at 100 f.p.m.[a]
F-4	6- 4-58	6-23-58	139	29.1	11.0	9.5	10.1	38.4	34.8	37.0	38.2	35.6	36.7	Satisfactory at 100 f.p.m.[a]
F-5	--	6-23-58	140	28.9	10.0	9.0	9.6	35.4	29.4	32.8	36.0	31.8	33.5	Satisfactory at 150 f.p.m.[a]
F-6	--	6-23-58	141	26.8	10.0	9.2	9.7	34.2	28.8	31.3	31.6	27.0	28.8	Satisfactory at 150 f.p.m.[a]
Current Machine Average				28.4			9.9			33.7			31.8	
Cumulative Machine Average				28.4			9.7			36.6			38.3	
Machine Factor, %				100.0			101.8			92.0			83.0	
Machine Index, %				105.0			96.3			95.8			88.7	

[a] With minimum tension.

TABLE IX

SUMMARY OF TEST RESULTS FOR MACHINE G
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
G-1	5-21-58	5-26-58	45	27.8	10.8	10.2	10.4	31.8	30.0	30.8	28.8	26.8	27.6	Satisfactory at 600 f.p.m.[a]
G-2	5-21-58	5-26-58	46	27.8	10.9	10.5	10.8	33.6	27.6	30.2	32.6	29.2	30.0	Satisfactory at 600 f.p.m.[b]
G-3	6-11-58	6-16-58	51	25.8	11.8	10.8	11.2	34.8	31.2	32.9	32.0	27.0	29.8	Satisfactory at 600 f.p.m.[a]
G-4	6-11-58	6-16-58	52	27.9	11.4	11.0	11.3	32.4	29.4	30.6	31.4	28.6	30.0	Satisfactory at 600 f.p.m.[a]
Current Machine Average				27.3			10.9			31.1			29.4	
Cumulative Machine Average				28.3			11.0			34.6			34.2	
Machine Factor, %				96.7			99.5			90.1			86.0	
Machine Index, %				101.1			106.0			88.5			82.0	

TABLE X

SUMMARY OF TEST RESULTS FOR MACHINE H
June, 1958

H-1	5-17-58	5-29-58	2A	26.9	10.7	10.2	10.4	38.4	34.8	36.4	35.8	32.4	33.5	Satisfactory at 600 f.p.m.[b]
H-2	5-23-58	5-29-58	2A	27.2	10.7	10.0	10.3	36.0	32.4	34.8	36.2	29.8	33.3	Satisfactory at 600 f.p.m.[c]
H-3	5-28-58	6-11-58	3A	26.7	10.8	10.1	10.3	39.6	36.6	38.6	36.2	33.8	35.3	Satisfactory at 600 f.p.m.[d]
H-4	6- 6-58	6-11-58	4A	26.3	10.4	9.9	10.1	36.0	33.6	35.2	33.0	30.4	31.5	Satisfactory at 600 f.p.m.[a]
H-5	6-12-58	6-18-58	--	26.8	10.6	10.0	10.2	38.4	34.8	36.8	34.0	30.8	32.4	Satisfactory at 600 f.p.m.[d]
H-6	6-13-58	6-18-58	--	26.5	10.4	9.9	10.1	36.6	34.2	35.4	32.4	30.4	31.3	Satisfactory at 600 f.p.m.[d]
Current Machine Average				26.7			10.2			36.2			32.9	
Cumulative Machine Average				26.4			10.3			34.7			34.8	
Machine Factor, %				101.4			99.2			104.2			94.4	
Machine Index, %				98.8			99.3			102.9			91.8	

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1/2 lb./in.
[c] With minimum tension.
[d] With tension of 1 lb./in.

TABLE XI

SUMMARY OF TEST RESULTS FOR MACHINE I
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
No samples submitted.														

TABLE XII

SUMMARY OF TEST RESULTS FOR MACHINE J
June, 1958

J-1	5-28-58	6- 3-58	178	27.7	9.8	9.0	9.3	36.6	33.0	34.6	33.8	29.2	32.0	Satisfactory at 600 f.p.m.[a]
J-2	5-29-58	6- 3-58	179	27.4	9.2	8.7	9.0	36.6	31.2	34.3	33.4	29.2	30.9	Satisfactory at 600 f.p.m.[a]
J-3	5-31-58	6-10-58	180	27.3	9.0	8.3	8.7	34.2	33.6	34.0	36.8	31.2	34.0	Satisfactory at 600 f.p.m.[b]
J-4	5-31-58	6-10-58	181	26.8	9.6	8.9	9.1	36.6	31.8	34.3	34.4	30.8	32.8	Satisfactory at 600 f.p.m.[c]
J-5	6- 6-58	6-11-58	182	28.3	9.9	9.1	9.4	39.0	37.8	38.4	35.6	32.0	33.5	Satisfactory at 600 f.p.m.[d]
J-6	6- 5-58	6-11-58	183	26.4	9.0	8.4	8.8	40.8	36.0	37.6	34.0	32.6	33.7	Satisfactory at 600 f.p.m.[d]
J-7	6-10-58	6-17-58	184	25.8	9.0	8.6	8.8	36.0	31.8	33.6	35.8	32.4	34.2	Satisfactory at 600 f.p.m.[a]
J-8	6-13-58	6-17-58	185	27.2	10.2	9.0	9.5	38.4	34.2	36.4	38.2	34.2	35.8	Satisfactory at 600 f.p.m.[a]
Current Machine Average				27.1			9.1			35.4			33.3	
Cumulative Machine Average				26.9			9.1			35.4			36.0	
Machine Factor, %				100.9			100.0			100.0			92.7	
Machine Index, %				100.2			88.2			100.5			93.1	

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1 lb./in.
[c] With tension of 1/2 lb./in.
[d] With minimum tension.

TABLE XIII

SUMMARY OF TEST RESULTS FOR MACHINE K
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
K-1	6- 4-58	6-10-58	49	27.4	10.3	9.9	10.1	36.0	30.6	34.0	32.8	27.8	30.5	Satisfactory at 600 f.p.m.[a]
K-2	6- 4-58	6-10-58	50	27.4	10.3	9.5	10.1	34.8	31.8	32.8	32.8	29.6	31.4	Satisfactory at 600 f.p.m.[a]
Current Machine Average				27.4			10.1			33.4			31.0	
Cumulative Machin e Average				27.2			10.2			34.6			36.2	
Machine Factor, %				100.8			98.7			96.3			85.7	
Machine Index, %				101.3			98.7			94.8			86.5	

TABLE XIV

SUMMARY OF TEST RESULTS FOR MACHINE L
June, 1958

L-1	5-14-58	5-29-58	3B	26.0	12.0	10.1	10.7	36.6	32.4	34.2	34.8	31.6	32.6	Satisfactory at 600 f.p.m.[b]
L-2	5-22-58	5-29-58	4B	26.1	11.5	10.2	10.6	36.0	32.4	34.3	36.2	33.0	34.5	Satisfactory at 600 f.p.m.[c]
L-3	5-24-58	5-29-58	5B	26.9	11.0	10.2	10.7	38.4	34.2	35.9	37.2	32.6	34.2	Satisfactory at 600 f.p.m.[d]
L-4	6-14-58	6-18-58	6B	26.5	10.9	10.0	10.5	39.0	36.0	37.1	37.2	32.4	34.8	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.4			10.6			35.4			34.0	
Cumulative Machine Average				26.2			10.4			33.5			34.3	
Machine Factor, %				100.7			101.7			105.5			99.3	
Machine Index, %				97.5			103.1			100.5			95.0	

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1 lb./in.
[c] With minimum tension.
[d] With tension of 1/2 lb./in.

TABLE XV

SUMMARY OF TEST RESULTS FOR MACHINE M
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
M-1	5-19-58	5-29-58	40	26.6	8.9	8.3	8.7	27.6	23.4	25.3	24.6	24.0	24.3	Satisfactory at 600 f.p.m.[a]
M-2	5-19-58	5-29-58	41	26.4	9.0	8.1	8.7	28.8	25.8	27.2	27.6	25.8	26.5	Satisfactory at 600 f.p.m.[b]
M-3	5-19-58	5-29-58	42	26.9	9.1	8.4	8.8	29.4	25.8	27.6	29.4	24.8	27.5	Satisfactory at 600 f.p.m.[a]
M-4	6-5- 58	6-16-58	43	28.2	9.7	8.9	9.2	40.2	32.4	36.5	35.8	32.4	33.8	Satisfactory at 600 f.p.m.[b]
M-5	6-5- 58	6-16-58	44	28.2	9.6	9.0	9.2	37.8	32.4	35.8	34.8	32.6	33.8	Satisfactory at 600 f.p.m.[b]
M-6	6-5- 58	6-16-58	45	28.4	9.5	8.9	9.2	37.8	31.8	33.8	35.0	32.0	33.8	Satisfactory at 600 f.p.m.[b]
M-7	6-17-58	6-23-58	46	26.0	9.0	8.3	8.8	31.8	29.4	30.2	31.2	30.0	30.7	Satisfactory at 600 f.p.m.[a]
M-8	6-17-58	6-23-58	47	26.1	9.0	8.3	8.7	32.4	29.4	30.4	31.8	29.8	30.8	Satisfactory at 600 f.p.m.[a]
M-9	6-17-58	6-23-58	48	25.7	9.2	8.3	8.8	32.4	28.8	30.7	32.4	28.2	30.6	Satisfactory at 600 f.p.m.[c]
Current Machine Average				26.9			8.9			30.8			30.2	
Cumulative Machine Average				27.3			9.4			31.1			32.0	
Machine Factor, %				98.5			94.6			99.2			94.2	
Machine Index, %				99.5			86.4			87.6			84.3	

TABLE XVI

SUMMARY OF TEST RESULTS FOR MACHINE N
June, 1958

No samples submitted.

[a] With tension of 1 lb./in.
[b] With tension of 1-1/2 lb./in.
[c] With tension of 1/2 lb./in.

TABLE XVII

SUMMARY OF TEST RESULTS FOR MACHINE O
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	

No samples submitted.

TABLE XVIII

SUMMARY OF TEST RESULTS FOR MACHINE P
June, 1958

No samples submitted.

TABLE XIX

SUMMARY OF TEST RESULTS FOR MACHINE Q
June, 1958

Q-1	5-21-58	5-29-58	3C	26.0	10.7	10.2	10.4	36.6	32.4	34.9	32.4	31.2	31.9	Satisfactory at 600 f.p.m.[a]
Q-2	5-29-58	6-11-58	4C	26.2	11.0	10.0	10.4	37.2	34.8	36.5	35.8	30.0	32.6	Satisfactory at 600 f.p.m.[b]
Q-3	6- 4-58	6-11-58	5C	26.1	10.7	10.0	10.3	39.0	36.0	37.0	34.6	32.6	34.0	Satisfactory at 600 f.p.m.[c]
Q-4	6-11-58	6-18-58	--	26.5	10.8	10.0	10.5	34.2	30.0	32.2	32.4	30.8	31.7	Satisfactory at 600 f.p.m.[b]
Current Machine Average				26.2			10.4			35.1			32.5	
Cumulative Machine Average				26.5			10.4			34.3			34.2	
Machine Factor, %				99.0			100.0			102.3			95.3	
Machine Index, %				96.9			100.9			99.8			90.9	

[a] With minimum tension.
[b] With tension of 1 lb./in.
[c] With tension of 1-1/2 lb./in.

TABLE XX

SUMMARY OF TEST RESULTS FOR MACHINE R
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
R-1	5-23-58	6- 3-58	88	27.4	11.8	11.0	11.3	31.8	30.0	31.3	31.4	28.2	30.3	Satisfactory at 600 f.p.m.[a]
R-2	5-27-58	6- 3-58	89	27.6	11.7	10.9	11.2	35.4	32.4	34.1	34.2	29.8	32.2	Satisfactory at 600 f.p.m.[a]
R-3	5-28-58	6- 3-58	90.	27.3	11.2	10.3	10.8	36.0	31.8	34.6	37.0	31.6	34.2	Satisfactory at 600 f.p.m.[a]
R-4	6- 4-58	6-16-58	91	26.9	10.7	10.0	10.2	36.6	33.6	35.6	37.0	33.4	35.0	Satisfactory at 600 f.p.m.[a]
R-5	6- 6-58	6-16-58	91	26.4	10.2	9.8	10.0	39.6	34.2	36.0	37.0	34.8	36.1	Satisfactory at 600 f.p.m.[b]
R-6	6-10-58	6-23-58	92	26.7	10.4	10.0	10.1	34.8	33.0	33.8	36.0	33.0	34.0	Satisfactory at 600 f.p.m.[a]
R-7	6-12-58	6-23-58	93	26.6	10.8	10.0	10.3	37.8	31.2	33.0	35.0	30.8	33.4	Satisfactory at 600 f.p.m.[a]
Current Machine Average				27.0			10.6			34.1			33.6	
Cumulative Machine Average				26.5			10.0			34.9			35.5	
Machine Factor, %				102.0			105.1			97.6			94.7	
Machine Index, %				99.7			102.5			96.8			93.8	

TABLE XXI

SUMMARY OF TEST RESULTS FOR MACHINE S
June, 1958

S-1	6-10-58	6-23-58	209	27.4	12.0	10.6	11.1	44.4	39.0	41.8	38.4	35.6	37.2	Satisfactory at 600 f.p.m.[b]
Current Machine Average				27.4			11.1			41.8			37.2	
Cumulative Machine Average				26.8			11.4			35.3			35.6	
Machine Factor, %				101.9			97.8			118.5			104.4	
Machine Index, %				101.1			108.0			118.7			103.8	

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1 lb./in.

TABLE XXII

SUMMARY OF TEST RESULTS FOR MACHINE T
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
T-1	5-16-58	5-26-58	163	28.4	11.1	10.3	10.7	33.6	31.8	32.8	34.0	31.2	32.1	Satisfactory at 600 f.p.m.[a]
T-2	5-21-58	5-26-58	165	27.9	11.2	10.1	10.7	33.0	28.2	31.1	31.4	28.6	30.3	Satisfactory at 600 f.p.m.[a]
T-3	5-27-58	6- 2-58	166	28.7	10.9	10.1	10.5	35.4	31.2	33.7	36.0	31.8	33.2	Satisfactory at 600 f.p.m.[a]
T-4	6- 3-58	6-10-58	167	28.6	11.2	10.2	10.7	34.8	33.0	33.7	34.0	32.4	33.1	Satisfactory at 600 f.p.m.[b]
T-5	6- 5-58	6-11-58	168	28.8	11.0	10.4	10.8	37.8	34.8	35.8	33.2	29.0	31.1	Satisfactory at 600 f.p.m.[a]
T-6	6-12-58	6-16-58	169	29.1	11.5	10.3	10.9	36.0	33.6	35.3	34.0	30.6	31.8	Satisfactory at 600 f.p.m.[a]
T-7	6-17-58	6-23-58	170	29.6	11.6	10.7	11.2	35.4	34.2	35.0	34.2	30.6	32.6	Satisfactory at 600 f.p.m.[a]
T-8	6-19-58	6-23-58	171	29.9	12.0	11.0	11.4	35.4	28.8	32.8	33.4	31.2	32.5	Satisfactory at 600 f.p.m.[c]
Current Machine Average				28.9			10.9			33.8			32.1	
Cumulative Machine Average				28.6			10.8			33.7			34.8	
Machine Factor, %				100.9			100.8			100.2			91.7	
Machine Index, %				106.8			105.5			95.9			89.6	

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1/2 lb./in.
[c] With tension of 1 lb./in.

TABLE XXIII

SUMMARY OF TEST RESULTS FOR MACHINE U
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
U-1	5-20-58	5-26-58	372	27.0	11.6	10.7	11.0	44.4	39.6	41.4	36.0	35.2	35.6	Satisfactory at 600 f.p.m.[a]
U-2	5-20-58	5-26-58	373	27.0	11.6	10.5	11.1	42.6	37.8	39.6	38.4	35.8	37.3	Satisfactory at 600 f.p.m.[a]
U-3	5-27-58	6- 3-58	374	26.3	11.8	10.6	11.1	43.2	38.4	40.1	36.6	33.8	35.2	Satisfactory at 600 f.p.m.[b]
U-4	6- 4-58	6-10-58	375	26.9	11.9	10.5	11.2	43.8	37.2	40.0	36.4	34.4	35.4	Satisfactory at 600 f.p.m.[b]
U-5	6- 6-58	6-11-58	376	26.5	11.5	10.7	11.1	42.6	34.8	39.1	39.0	34.0	36.3	Satisfactory at 600 f.p.m.[c]
U-6	6-10-58	6-13-58	377	27.2	11.9	10.6	11.2	42.6	39.0	40.6	37.8	34.4	36.1	Satisfactory at 600 f.p.m.[b]
U-7	6-13-58	6-18-58	378	26.9	11.9	10.2	11.2	45.0	38.4	41.4	37.8	36.0	37.0	Satisfactory at 600 f.p.m.[a]
U-8	6-18-58	6-23-58	379	26.5	11.3	10.0	10.4	41.4	40.2	40.7	38.4	35.8	37.7	Satisfactory at 600 f.p.m.[c]
U-9	6-20-58	6-23-58	380	26.8	11.6	10.6	11.0	43.2	37.8	39.6	41.4	35.8	37.7	Satisfactory at 600 f.p.m.[c]
Current Machine Average				26.8			11.0			40.3			36.5	
Cumulative Machine Average				26.7			11.0			38.9			39.2	
Machine Factor, %				100.5			100.0			103.4			93.1	
Machine Index, %				99.0			107.2			114.4			101.9	

[a] With tension of 1 lb./in.
[b] With tension of 1/2 lb./in.
[c] With tension of 1-1/2 lb./in.

TABLE XXIV

SUMMARY OF TEST RESULTS FOR MACHINE V
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points Max.	Caliper, points Min.	Caliper, points Av.	Concora Flat Crush, p.s.i. Max.	Concora Flat Crush, p.s.i. Min.	Concora Flat Crush, p.s.i. Av.	Single-Face Flat Crush, p.s.i. Max.	Single-Face Flat Crush, p.s.i. Min.	Single-Face Flat Crush, p.s.i. Av.	Runability
V-1	4-25-58	5-26-58	--	26.9	10.1	9.8	10.0	40.2	34.8	36.7	33.2	32.0	32.7	Satisfactory at 600 f.p.m.[a]
V-2	5- 5-58	5-26-58	--	27.0	10.3	10.0	10.2	37.2	33.6	35.0	34.6	31.4	33.0	Satisfactory at 600 f.p.m.[a]
V-3	5-8-58	5-29-58	--	26.1	11.2	9.8	10.1	32.4	28.2	30.0	32.4	29.4	30.8	Satisfactory at 600 f.p.m.[a]
V-4	5-9-58	5-29-58	--	26.3	11.0	9.8	10.1	33.6	30.0	32.0	33.6	31.0	32.1	Satisfactory at 600 f.p.m.[b]
V-5	5-13-58	6- 3-58	--	26.9	10.7	10.0	10.2	33.0	31.2	32.2	31.6	29.4	30.7	Satisfactory at 600 f.p.m.[a]
V-6	5-15-58	6- 3-58	--	25.5	9.8	9.0	9.2	33.6	30.0	31.9	33.2	28.0	30.4	Satisfactory at 600 f.p.m.[a]
V-7	5-30-58	6-24-58	--	25.7	9.8	9.1	9.4	33.0	31.2	32.3	35.2	31.0	32.2	Satisfactory at 600 f.p.m.[a]
V-8	5-31-58	6-24-58	--	27.7	9.9	9.2	9.5	37.8	35.4	36.4	34.6	32.0	33.7	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.5			9.8			33.3			31.9	
Cumulative Machine Average				26.5			10.0			33.7			33.0	
Machine Factor, %				100.0			98.1			99.0			96.9	
Machine Index, %				97.9			95.2			94.7			89.2	

[a] With tension of 1-1/2 lb./in.
[b] With tension of 1 lb./in.

TABLE XXV

SUMMARY OF TEST RESULTS FOR MACHINE W
June, 1958

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Runability
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
W-1	5-26-58	6- 2-58	169	25.5	10.0	9.3	9.7	35.4	32.4	34.6	32.8	30.6	31.8	Satisfactory at 600 f.p.m.[a]
W-2	5-29-58	6-10-58	170	26.0	10.0	9.8	10.0	39.0	33.0	35.0	36.2	32.2	33.6	Satisfactory at 500 f.p.m.[b]
W-3	6- 3-58	6-10-58	171	26.7	10.5	10.0	10.2	41.4	34.8	37.1	34.8	31.6	32.6	Satisfactory at 150 f.p.m.[b]
W-4	6- 5-58	6-10-58	172	26.7	10.9	10.0	10.4	39.0	36.6	37.7	34.2	32.0	33.1	Satisfactory at 600 f.p.m.[a]
W-5	6-12-58	6-16-58	173	25.9	10.0	9.8	9.9	42.0	37.2	39.0	37.6	34.8	36.4	Satisfactory at 600 f.p.m.[a]
Current Machine Average				26.2			10.0			36.7			33.5	
Cumulative Machine Average				26.6			10.4			36.4			36.8	
Machine Factor, %				98.3			96.5			100.7			91.1	
Machine Index, %				96.8						104.2			93.6	

TABLE XXVI

SUMMARY OF TEST RESULTS FOR MACHINE X
June, 1958

No samples submitted.

[a] With tension of 1/2 lb./in.
[b] With minimum tension.

TABLE XXVII

COMPARISON OF INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS FOR JUNE, 1958

Machine B

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
B-1	222	5-20-58	37.4	37.9	+0.5
B-2	223	5-23-58	35.2	36.5	+1.3
B-3	224	5-30-58	34.1	38.0	+3.9
B-4	225	6- 3-58	40.0	37.6	-2.4
B-5	226	6- 5-58	39.2	41.2	+2.0
B-6	227	6-10-58	36.8	38.9	+2.1
B-7	228	6-12-58	36.4	36.6	+0.2

Machine C

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
C-1	--	4-23-58	32.9	35.0	+2.1
C-2	--	4-26-58	33.5	37.9	+4.4
C-3	--	5- 7-58	34.1	36.7	+2.6
C-4	--	5-10-58	34.7	37.2	+2.5
C-5	--	5-14-58	31.7	35.8	+4.1
C-6	--	5-16-58	36.7	34.8	-1.9
C-7	--	6- 2-58	34.0	36.8	+2.8
C-8	--	6- 3-58	25.0	37.4	+2.4

MachineE

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
E-1	47	5-29-59	29.4	29.2	-0.2
E-2	48	5-30-58	32.0	36.1	+4.1

Machine G

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
G-1	45	5-21-58	30.8	34.4	+3.6
G-2	46	5-21-58	30.2	34.5	+4.3
G-3	51	6-11-58	32.9	38.0	+5.1
G-4	52	6-11-58	30.6	40.2	+9.6

Machine H

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
H-1	2A	5-17-58	36.4	48.5	+12.1
H-2	2A	5-23-58	34.8	48.0	+13.2
H-3	3A	5-28-58	38.6	46.8	+8.2
H-4	4A	6- 6-58	35.2	43.6	+8.4
H-5	--	6-12-58	36.8	47.3	+10.5
H-6	--	6-13-58	35.4	46.7	+11.3

Machine K

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
K-1	49	6- 4-58	34.0	38.1	+4.1
K-2	50	6- 4-58	32.8	37.0	+4.2

Machine L

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
L-1	3B	5-14-58	34.2	47.6	+13.4
L-2	4B	5-22-58	34.3	47.9	+13.6
L-3	5B	5-24-58	35.9	48.5	+12.6
L-4	6B	6-14-58	37.1	48.2	+11.1

Machine M

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
M-1	40	5-19-58	25.3	31.1	+5.8
M-2	41	5-19-58	27.2	31.7	+4.5
M-3	42	5-19-58	27.6	35.5	+7.9
M-4	43	6- 5-58	36.5	39.8	+3.3
M-5	44	6- 5-58	35.8	36.4	+0.6
M-6	45	6- 5-58	33.8	38.9	+5.1
M-7	46	6-17-58	30.2	36.6	+6.4
M-8	47	6-17-58	30.4	34.8	+4.4
M-9	48	6-17-58	30.7	36.4	+5.7

Machine Q

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
Q-1	3C	5-21-58	34.9	47.9	+13.0
Q-2	4C	5-29-58	36.5	45.1	+8.6
Q-3	5C	6- 4-58	37.0	46.6	+9.6
Q-4	--	6-11-58	32.2	43.8	+11.6

Machine R

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
R-1	88	5-23-58	31.3	40.8	+9.5
R-2	89	5-27-58	34.1	42.2	+8.1
R-3	90	5-28-58	34.6	43.7	+9.1
R-4	91	6- 4-58	35.6	41.9	+6.3
R-5	91	6- 6-58	36.0	36.6	+0.6
R-6	92	6-10-58	33.8	39.5	+5.7
R-7	93	6-12-58	33.0	40.9	+7.9

Machine S

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
S-1	209	6-10-58	41.8	39.1	-2.7

Machine U

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
U-1	372	5-20-58	41.4	38.0	-3.4
U-2	373	5-20-58	39.6	38.6	-1.0
U-3	374	5-27-58	40.1	40.3	+0.2
U-4	375	6-4-58	40.0	39.5	-0.5
U-5	376	6-6-58	39.1	39.2	+0.1
U-6	377	6-10-58	40.6	42.6	+2.0
U-7	378	6-13-58	41.4	41.4	0.0
U-8	379	6-18-58	40.7	45.0	+4.3
U-9	380	6-20-58	39.6	42.4	+2.8

Machine V

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
V-1	--	4-25-58	36.7	38.6	+1.9
V-2	--	5- 5-58	35.0	35.6	+0.6
V-3	--	5- 8-58	30.0	32.9	+2.9
V-4	--	5- 9-58	32.0	36.3	+4.3
V-5	--	5-13-58	32.2	32.9	+0.7
V-6	--	5-15-58	31.9	32.3	+0.4
V-7	--	5-30-58	32.3	33.5	+1.2
V-8	--	5-31-58	36.4	36.1	-0.3

Machine W

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference
W-1	169	5-26-58	34.6	37.7	+3.1
W-2	170	5-29-58	35.0	41.6	+6.6
W-3	171	6- 3-58	37.1	34.3	-2.8
W-4	172	6- 5-58	37.7	35.9	-1.8
W-5	173	6-12-58	39.0	44.4	+5.4

APPENDIX

A comparison of flat crush and runability data for the old and new corrugators is shown in Table XXVIII. (The code letters used in this table do not correspond to any used in previous reports.) Where it was possible to do so, four roles from each machine (the rolls having been fabricated on the old corrugator just prior to the change-over to the new corrugator) were set aside for the purpose of subsequent evaluation on the new corrugator so that it would be possible to have a benchmark against which to judge the performance of the new corrugator. When installation of the new corrugator had been completed, these rolls were evaluated on it. In addition to this, the rolls were evaluated again for their Concora flat crush strength in order to have a secondary means of determining whether the medium itself had changed in some of its characteristics.

It may be noted in Table XXVIII that runability results were not vastly different for the old and new corrugators for the same rolls of semi-chemical corrugating medium. In the case of kraft corrugating mediums it appeared that mediums exhibiting runabilities below 600 f.p.m. on the old corrugator tended to exhibit even lower runabilities on the new corrugator. Bogus corrugating mediums ran approximately the same on both corrugators.

The Concora flat crush data corresponding to the date of fabrication on the old corrugator--i.e., the original data--were in close agreement with the data obtained at the time the rolls were evaluated on the new corrugator--i.e., the recheck data. The original average for 57 rolls of medium

was 33.9 p.s.i. and the recheck average was 34.3 p.s.i. On the basis of these results, one would assume that the flat crush potential was unchanged significantly. At the same time it must be remembered that these results leave unanswered any questions about changes in runability characteristics.

From a review of the single-face flat crush data in Table XXVIII for the same rolls fabricated on the old and new corrugators, it is evident that the results associated with the new corrugator are lower than the corresponding results associated with the old corrugator. This observation was mentioned briefly in the preface of this report where it was noted that the forming pressure between the corrugating rolls was believed to be slightly different for the old and the new corrugators because the diameters of the rolls were considerably different--namely, eight inches for the old corrugator and twelve inches for the new corrugator. This factor is being investigated and will require considerable time to resolve in view of its complexity.

Other factors may also be contributing to this difference in single-face flat crush. One factor may be that corrugators are similar but never exactly alike and hence cannot be expected to perform in precisely the same way. Another is the fact that corrugating mediums may change over a period of time such as was involved here between the dates of fabrication on the old and the new corrugators. Other factors of less importance might also be considered. Hence, the resolution of the problem is not easy but it is hoped that the investigations now under way will explain wholly or in part why lower single-face flat crush results are currently being obtained on the new corrugator.

TABLE XXVIII

COMPARISON OF FLAT CRUSH AND RUNABILITY DATA FOR THE OLD AND NEW CORRUGATORS

Code	Month	Type of Medium	Date of Fabrication: Old Corrugator	Date of Fabrication: New Corrugator	Runability: Old Corrugator: Speed, f.p.m.	Runability: Old Corrugator: Tension, lb./in.	Runability: New Corrugator: Speed, f.p.m.	Runability: New Corrugator: Tension, lb./in.	Concora Flat Crush, p.s.i.: Original	Concora Flat Crush, p.s.i.: Recheck	Single-Face Flat Crush, p.s.i.: Old Corrugator	Single-Face Flat Crush, p.s.i.: New Corrugator
A-1	Feb., 1958	Semichemical	2-26-58	6-10-58	600	min.	600	1/2	33.6	35.0	35.5	33.1
A-2	Feb., 1958	Semichemical	2-27-58	6-10-58	600	min.	600	min.	32.4	36.8	35.2	33.4
A-3	Feb., 1958	Semichemical	2-27-58	6-10-58	600	min.	600	1/2	31.3	31.2	35.0	31.4
A-4	March, 1958	Semichemical	3-17-58	6-10-58	600	min.	600	min.	32.6	33.0	35.2	33.5
B-1	March, 1958	Semichemical	3-21-58	6-10-58	600	1-1/2	600	1	33.1	34.0	35.0	32.0
B-2	March, 1958	Semichemical	3-21-58	6-10-58	600	1-1/2	600	1	30.2	32.3	35.9	22.6
B-3	March, 1958	Semichemical	3-21-58	6-10-58	600	1-1/2	600	1	34.1	32.0	35.8	32.5
B-4	March, 1958	Semichemical	3-21-58	6-10-58	600	1/2	600	1	31.3	32.3	36.8	32.9
C-1	Feb., 1958	Semichemical	2-27-58	6-10-58	600	min.	600	1/2	33.1	31.6	34.8	34.4
C-2	March, 1958	Semichemical	3-21-58	6-10-58	600	1	600	1/2	32.7	32.3	34.3	29.1
C-3	March, 1958	Semichemical	3-21-58	6-10-58	600	1/2	600	1/2	34.6	30.8	31.6	27.3
C-4	Feb., 1958	Semichemical	2-27-58	6-10-58	600	1-1/2	600	1/2	34.6	37.9	37.8	31.9
D-1	Feb., 1958	Semichemical	2-26-58	6-10-58	600	1	600	1	29.9	30.4	33.0	30.4
D-2	Feb., 1958	Semichemical	2-26-58	6-10-58	600	1/2	600	1/2	32.9	36.2	36.3	34.1
D-3	March, 1958	Semichemical	3-17-58	6-10-58	600	1-1/2	600	1	37.2	34.6	37.4	33.8
D-4	March, 1958	Semichemical	3-26-58	6-10-58	600	1-1/2	600	1/2	36.0	29.0	32.5	32.7
E-1	March, 1958	Semichemical	3-21-58	6-10-58	600	1-1/2	600	1	34.0	33.2	37.7	30.4
E-2	March, 1958	Semichemical	3-21-58	6-10-58	600	1-1/2	600	1/2	36.4	32.5	38.7	33.8
E-3	Feb., 1958	Semichemical	2-27-58	6-10-58	600	1/2	600	1	32.6	35.5	39.2	34.5
F-1	Feb., 1958	Semichemical	2-27-58	6-10-58	600	1/2	600	1/2	34.2	35.3	33.1	30.9
F-2	Mar., 1958	Semichemical	3-17-58	6-10-58	600	1	600	1/2	33.8	34.3	34.1	33.4
F-3	Mar., 1958	Semichemical	3-17-58	6-10-58	600	1/2	600	1/2	33.5	34.3	36.1	31.3
F-4	Feb., 1958	Semichemical	2-14-58	6-10-58	600	1/2	200	min.	34.4	37.4	34.6*	No sample
G-1	Feb., 1958	Semichemical	2-27-58	6-10-58	600	1/2	600	1/2	33.5	35.5	36.6	35.2
G-2	Feb., 1958	Semichemical	2-27-58	6-10-58	600	1/2	600	1	35.6	34.8	32.3	32.6
G-3	Marc., 1958	Semichemical	3-21-58	6-10-58	600	1-1/2	600	1/2	33.6	32.0	33.4	33.3
G-4	Feb., 1958	Semichemical	2-26-58	6-10-58	600	1/2	600	1	29.0	35.2	30.7*	No sample

* This value is excluded from the over-all average because there is no comparable value for the new corrugator.

TABLE XXVIII--Continued

COMPARISON OF FLAT CRUSH AND RUNABILITY DATA FOR THE OLD AND NEW CORRUGATORS

Code	Month	Type of Medium	Date of Fabrication: Old Corrugator	Date of Fabrication: New Corrugator	Runability: Old Corrugator Speed, f.p.m.	Runability: Old Corrugator Tension, lb./in.	Runability: New Corrugator Speed, f.p.m.	Runability: New Corrugator Tension, lb./in.	Concora Flat Crush, p.s.i.: Original	Concora Flat Crush, p.s.i.: Recheck	Single-Face Flat Crush, p.s.i.: Old Corrugator	Single-Face Flat Crush, p.s.i.: New Corrugator
H-1	Feb., 1958	Semichemical	2-27-58	6-10-58	600	min.	600	min.	39.7	38.3	39.6	37.8
H-2	Mar., 1958	Semichemical	3-17-58	6-10-58	600	1/2	600	1/2	39.8	40.0	40.6	37.8
H-3	Mar., 1958	Semichemical	3-21-58	6-10-58	600	min.	600	min.	37.7	33.3	40.9	30.7
H-4	Mar., 1958	Semichemical	3-21-58	6-10-58	600	1	600	1	38.9	36.0	39.2	32.6
I-1	Mar., 1958	Semichemical	3-17-58	6-10-58	600	1/2	600	1	36.2	34.9	38.8	34.7
I-2	Mar., 958	Semichemical	3-26-58	6-10-58	600	1-1/2	600	1	38.3	36.4	41.8	38.3
J-1	Mar., 1958	Semichemical	3-21-58	6-10-58	600	1-1/2	600	1/2	31.2	31.1	33.9	31.2
J-2	Mar., 1958	Semichemical	3-21-58	6-10-58	600	1-1/2	600	1/2	32.6	30.6	34.6	32.5
J-3	Feb., 1958	Semichemical	2-27-58	6-10-58	600	1/2	600	1	34.3	35.6	35.8	34.6
J-4	Mar., 1958	Semichemical	2-27-58	6-10-58	600	1/2	600	1/2	29.0	29.0	33.2	27.7
K-1	Mar., 1958	Semichemical	3-21-58	6-10-58	600	1/2	600	min.	37.4	35.3	39.9	36.4
K-2	Mar., 1958	Semichemical	3-17-58	6-10-58	600	1/2	600	1	31.7	31.3	33.8	31.5
K-3	Feb., 1958	Semichemical	2-27-58	6-10-58	600	min.	600	1/2	29.6	35.6	31.0	30.2
K-4	Mar., 1958	Semichemical	3-27-58	6-10-58	575	min.	600	min.	34.0	32.6	34.9	31.6
L-1	Feb., 1958	Semichemical	2-26-58	6-10-58	600	1-1/2	600	1-1/2	34.7	33.5	36.2	30.9
L-2	Feb., 1958	Semichemical	2-26-58	6-10-58	600	1/2	600	1-1/2	34.1	39.0	36.9	32.8
L-3	Mar., 1958	Semichemical	3-17-58	6-10-58	600	min.	600	1/2	36.2	35.8	37.5	33.4
L-4	Feb., 1958	Semichemical	2-26-58	6-10-58	600	min.	600	1	34.9	38.2	38.7	34.3
M-1	Feb., 1958	Kraft	2-26-58	6-10-58	600	1	600	min.	30.8	35.9	34.8*	--
M-2	Feb., 1958	Kraft	2-26-58	6-10-58	600	1	600	1-1/2	30.2	35.8	34.1	30.3
M-3	March, 1958	Kraft	3-21-58	6-10-58	600	1-1/2	600	1/2	32.3	29.4	32.1	30.4
M-4	March, 1958	Kraft	3-21-58	6-10-58	600	1-1/2	600	1	33.7	29.6	33.2	29.7
N-1	Feb., 1958	Kraft	2-27-58	6-10-58	425	min.	125	min.	38.9	38.2	40.3	37.2
N-2	Feb., 1958	Kraft	2-26-58	6-10-58	375	min.	100	min.	32.4	36.1	36.5	30.8
N-3	Mar., 1958	Kraft	3-21-58	6-10-58	400	min.	125	min.	40.1	36.7	41.8	33.0
N-4	Feb., 1958	Kraft	2-27-58	6-10-58	500	min.	300	min.	33.7	37.7	37.0	33.8
O-1	Dec., 1957	Kraft	12-10-57	6-10-58	400	min.	Below 50	min.	--	--	32.2**	--
O-2	Sept.,1957	Kraft	9-12-57	6-10-58	Below 50	min.	Below 50	min.	--	--	29.5**	--
P-1	Feb., 1958	Bogus	2-27-58	6-10-58	600	1/2	600	1/2	31.1	33.5	33.9	33.6
P-2	March,1958	Bogus	2-27-58	6-10-58	600	min.	600	1-1/2	36.6	32.2	33.8	33.8
P-3	March,1958	Bogus	3-21-58	6-10-58	600	1/2	600	1/2	31.9	31.9	33.1	32.0
P-4	Feb., 1958	Bogus	2-26-58	6-10-58	600	min.	600	min.	30.8	35.3	35.1	32.5
								Average	33.9	34.3	36.0	32.7

* This value is excluded from the over-all average because there is no comparable value for the new corrugator.

** These results have been omitted from the average because fractured flutes were evident for the rolls fabricated on the new corrugator and also for one of the rolls (K-1) fabricated on the old corrugator.